P Tech S

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AUXILIARY MOTOR SCHOONER "MARTHA" (Drawings). *See p.* 625.

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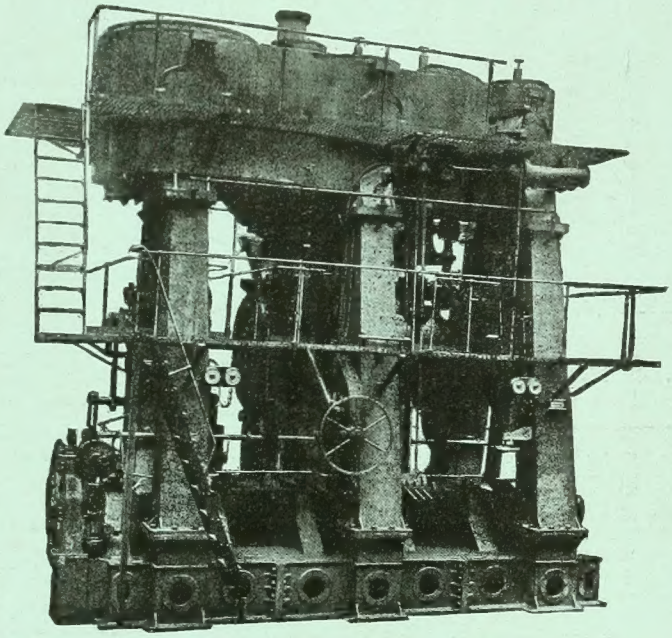

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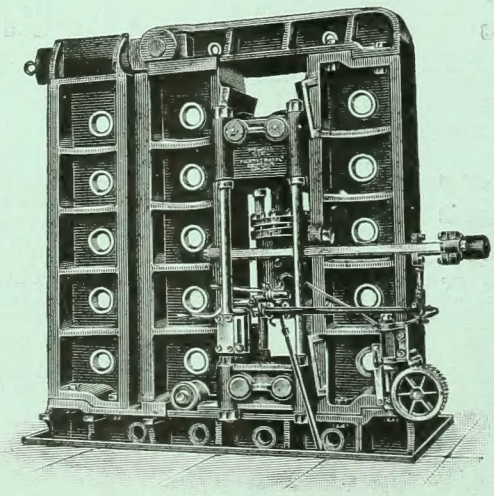

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IT has long been realised by shipbuilders and those who are aware of the conditions existing in the shipyards at the present time that one of the greatest obstacles to the rapid production of tonnage was the delay which was frequently caused owing to work on a vessel being held up on account of the failure of an outside firm to deliver some essential part of the vessel or its equipment, and it has been officially announced that one of the reasons for the adoption of the policy of standardisation was that it enabled any part to be immediately dispatched to any vessel which was awaiting such a part. Lord Pirrie, Controller-General of Merchant Shipbuilding, has been quick to recognise the supreme importance of this question of supplies, and he has therefore set up a new Department to deal with supplies for the equipment of the national shipyards and the construction of standard ships. Major W. J. Hamilton, of Port Glasgow, is in charge of this Department, Major J. L. Marr, of Sunderland, is his deputy, while Mr. H. Cocks, of Cardiff, has been appointed Assistant-Director of Supplies. Lord Inchcape, in a letter which he recently addressed to this journal, pointed out the delay which had occurred in the completion of the national shipyard at Chepstow, but the appointment of the new Department shows that Lord Pirrie is determined that the position with regard to equipment shall be improved as quickly as possible, and since nearly the whole of the merchant shipbuilding of the country at the present time is in the form of standard ships, the new Department should do much in the direction of accelerating shipbuilding output.

Speeding-up Merchant Shipbuilding.

We have recently referred to the length of time which is taken nowadays in getting long-outstanding claims settled. Two interesting cases of this nature have recently been before underwriters. The first is a claim for collision, which occurred in 1913, one of the colliding vessels being sunk and a total loss paid on it. Legal proceedings have now decided that the other vessel was entirely to blame and so underwriters are receiving a substantial refund on the total loss which they have settled, while those on the vessel at fault are paying their liability. The other case is that of a vessel missing in 1915 on a voyage home from Archangel. In this case a compromise has been arranged between the war risk and marine risk underwriters, by which 66⅔ per cent. of the loss is paid by the marine risk underwriters, the balance falling on those interested in the war risk. It is satisfactory to note that these long-outstanding affairs are now coming up for settlement, and it is to be hoped that the very many similar cases left to be dealt with will soon be definitely cleared up.

Two Old Claims.

The insurance of auxiliary motor vessels has been a source of trouble to underwriters for some time. One of the greatest difficulties in this class of business is to determine exactly what an auxiliary motor vessel is. In the past there has been controversy on this point and the need of some definite rule by which such discussions could be settled has become apparent. At last some attempt has been made to clear up the obscurity referred to, though it is of a somewhat negative character. In the past, cargo underwriters have accepted insurances of steamers and motor vessels on open covers, and, under the heading of power vessels have accepted risks in sailing vessels fitted with auxiliary power. Such risks are evidently outside the meaning of "Power vessels," as stated in the open policies, so underwriters have notified their intention of not accepting such risks in the future, and in order to determine what vessels are or are not acceptable they have decided that any vessel which appears in the steamers and sailing ship books of Lloyd's Register and the Bureau Veritas shall be deemed auxiliary vessels and as such not acceptable under covers which include motor vessels.

Insuring Auxiliary Motor Vessels.

It seems to us that the principles of the proximate cause which were so lucidly laid down by Lord Shaw in the House of Lords recently in the case of the *Ikaria* are clearly applicable to the case of the *El Zorro*. The vessel continued in the grip of the one and the same casualty from the time of the torpedoing by a hostile submarine until she became a total wreck, and consequently her loss was attributable to a war risk. Three judges in the King's Bench Division have concurred in taking this view respecting the loss of the *El Zorro*, although an arbitrator previously had decided that there was an intervening marine peril. The *El Zorro*, which belonged to the Lobitos Oil Fields, Ltd., was under requisition by the Admiralty when she was torpedoed off the Irish Coast in December, 1915. She was rendered helpless and was taken in tow by tugs. Bad weather occurred and the crew had to be taken off. The *El Zorro* was afterwards found a total wreck. The terms of the Admiralty engagement made it liable for risks out of the protection of an ordinary marine policy with an F. C. and S. clause. It was claimed by the Admiralty that the events of the bad weather constituted an intervening cause which made the loss of the vessel attributable to a marine risk. It was held in the King's Bench Division that the storm would not have caused the loss of the ship had she not been torpedoed. In other

Requisitioned Vessel and War Risk.

words she was continuously in the grip of the war peril, and her loss was attributable proximately to a war risk.

Marine or War Loss.

There is no doubt that the result of the case brought by the owners of the steamer *El Zorro* against the Admiralty will find favour with the underwriters on the marine risk policies of the steamer. The case presents several unusual points which make it of considerable interest. In the first case it will be remembered that after being torpedoed the *El Zorro* was taken in tow by the *Freezia* and was making for Queenstown. She was subsequently taken in tow by the *Hellespont* and *Stormcock*, acting under the orders of the Admiralty superintendent at that port. It would seem that there was some delay in getting the damaged vessel on her way, and in the evening these two tugs left her at anchor off Daunts rock, the position being an exposed one. Bad weather came on and she dragged ashore, eventually becoming a total wreck. This much came out in an action brought under the Arbitration Act, when the Court decided that the vessel was lost by a marine peril. The further action, which has just been decided, was brought by the owners under the conditions of Charter Party T 99, in the King's Bench division, and Mr. Justice Darling's decision was endorsed by Justices Bailhache and Sankey, the loss being attributable in their opinion to a war peril. A point which came out during the case, and which does not seem to have been satisfactorily cleared up, was that Kinsale was a nearer port than Queenstown to the place of the casualty, and that there was a greater chance of saving the vessel had she made for that port. However, the loss having been definitely settled as attributable to a war peril the marine underwriters will be quite satisfied to leave speculation on this point to those concerned.

South Coast Development.

On several occasions reference has been made in these columns to the likely extension of shipping facilities at South Coast ports, and the necessity of making the most of our advantages in the channel in case of future requirements. Special mention was made of Falmouth as the first convenient port of call for vessels arriving from overseas, notably the Dominions, but we did not anticipate the exceptionally important development, whose significance has been generally overlooked, as a result of the acquisition of the dock property there by the P. & O. —British India interests, which, of late, have been expanding to a remarkable extent, under the chairmanship of Lord Inchcape. Exactly what will happen we do not profess to know, but it is tolerably certain that there will be an effort to make the most of the favourable situation, even though the railway difficulties are not to be ignored. Yet worse have been overcome. At present, we understand, ships of large size can safely enter and leave the harbour at any state of the tide, and a scheme has been proposed for the construction of a pier about 3,000 ft. long, at which three of the largest ocean steamers can at one time land or embark passengers, mails, or goods; the building of two graving docks up to 1,200 ft. in length, and the provision of jetties, wharves, and warehouses. This project may now, of course, be modified, but it is evident that the possibilities are great

Apologies for Shipping.

We do not know how individual shipowners regard the matter, but it seems to us that the obligation which some commentators lay upon themselves to defend the industry every time part of its due is paid to it involves some loss of dignity. The new Blue Book rates are not, strictly speaking, a concession, although the shipowners who will get them are grateful enough for them. They are part of the industry's due, and they have been too long in coming. The tendency shown to disown criticism of the "concession" in advance by protesting that shipowners are not profiteers of the most pronounced type is, therefore, both lacking in dignity and unwittingly unjust to a class of business men whose war service has been, and is, splendid. It is true that British shipping's critics are not confined to political extremists. Some important non-shipping commercial interests are of the opinion that the British owner's resort to combinations has not been in the best interest of the Empire's trade. For each of these, of course, "the Empire's trade" is its own particular trade; in its final form their collective ideas would, therefore, be at the worst a mass of conflicting interests, and at the best a bundle of compromises. If it were a mass of conflicting interests, what Government would care to look at it? If it were a bundle of compromises, which would be likely to show more sympathy in accommodating it—the State or the private shipowner? The truth is, that on a just average the trader-critic's ground of complaint against the shipowner is very slight, and that to apologise in advance to him involves something more than mere loss of dignity. British shipping's whole case is quite a good one.

Salvage by Requisitioned Ships.

In passing in review the recent judicial decision awarding to the Admiralty £4,500 for services rendered as salvage by a requisitioned tug, one important point should not be overlooked. The terms on which it was serving at the time when the services were rendered are the determining factor. To use a legal technical phrase the tug, the *Conqueror*, was on charter by demise to the Admiralty. That is to say, the Admiralty had complete disposal and control of ship and crew, and took all the risks. Indeed, when the tug was damaged in rendering services to the vessel in question, the *Sussex*, the Admiralty made good the damage. This indeed shows the terms of the agreement were entirely different from those usually embodied in a charter. Mr. Justice Bailhache laid it down that a vessel thus chartered by way of demise was for the time being "a ship belonging to His Majesty." The result in law was that the right to claim salvage passed from the owners to the Admiralty. Under the Merchant Shipping Act, 1894, ships belonging to His Majesty do not recover salvage awards in the way privately-owned vessels do. This, however, has been modified since the war began by the Merchant Shipping (Salvage) Act, and it was in virtue of this statute that the award thus became payable in this case. The decision has reference only to requisitioned vessels which are serving under the conditions constituting a charter by demise. An ordinary charter does not fall within this category at all, and the decision therefore covers only a limited and defined number of vessels.

Bad Timekeeping.

Timekeeping competitions are apparently as unpopular in some labour circles as riveting contests, for it is understood that the representatives of an important section of shipyard workers are uncompromisingly opposed to the *Daily Mail's* scheme. Our own opinion of riveting contests is that if they have the effect of stimulating the activity of the average riveter they are worth while, but not otherwise. On the newer question we are of opinion that the action of the *Daily Mail* is a move in the right direction, and that Lord Northcliffe is to be praised for taking such a step. But for the unsatisfactory timekeeping of the pieceworkers the tonnage output would be much greater. Even objectors to the proposed competition have not the courage to deny that, and the general public has not been slow to make a note of the fact. The man in the street is perfectly clear in his mind as to the actual position, and the conclusions which he draws is quite sane and thoroughly sound. He argues that if the timekeeping of the pieceworkers is as unsatisfactory as the records make it out to be, the effect upon output must be serious. Accordingly, he thinks that in these circumstances Unions have no title to object to proposals made with the object of

improving it until they show an inclination to do something in the matter themselves. It is almost unnecessary to say that we share that view, and await with interest an expression of the Trade Unions' opinion upon it.

A Fabricated Ship Launched.

What is claimed to be the first fabricated ship was successfully launched in the United States on Commemoration Day, May 30, at the yard of the Submarine Boat Corporation, Newark Bay. The vessel has been entirely built from sections and plates used hitherto for the construction of bridges and other structures, these having been produced at inland yards and sent down to the coast where they were assembled. The fabricated ships possess many interesting features, especially with regard to their propelling machinery, which has to a large extent been produced by firms who have not hitherto produced machinery for marine purposes. The vessels are 343 ft. long, having a moulded breadth of 46 ft. and a moulded depth of 28 ft. 6 in. The deadweight carrying capacity is about 5,500 tons. The propelling machinery consists of a Westinghouse steam turbine running at 3,600 r.p.m. driving a single screw through reduction gearing at 90 r.p.m., steam being supplied by two Babcock & Wilcox water-tube boilers. The combination of geared turbines with water-tube boilers for cargo ships, although by no means a novelty, is somewhat in the nature of an experiment, and shipowners will watch with interest the cost of running and the way these vessels shape in actual service.

Shipbuilding and Publicity.

Considering the efforts which are in progress to stimulate interest in merchant shipbuilding, the official disinclination to revert in part to the industry's own pre-war publicity methods is not unreasonably regarded as odd. It is argued that they are doing this sort of thing much better on the other side of the Atlantic where announcements concerning launchings and completions are circulated to the Press with notes of periods of construction, names of builders, and other interesting particulars. Here, nothing of the kind is permitted, with the inevitable result that there is little or no public interest in the large programme of new construction which the Department of the Controller General of Merchant Shipbuilding is carrying out. Lord Pirrie's view may be, of course, that there is no real need to be more communicative to the public than is the case. Not knowing the facts as intimately as he does, we are not disposed to argue the matter. There is, however, an aspect which deserves closer examination than it, as a rule, gets. The steady booming of the American industry and its fabricated and other standard ships, compared with the persistent official silence regarding the British industry and its work, is unmistakably giving the world the impression that our newest Ally is eclipsing us. The Admiralty may, of course, know better than that; but unless the world of prospective buyers is allowed to share the knowledge, our shipbuilding industry will be bound to suffer after the war. What is needed is a little less reticence just now, and a great deal more could obviously be published without hurt to any military or naval interest.

Weight of Reinforced Concrete Hulls.

In the many papers that have recently been presented to the various naval architects' and shipbuilders' institutions dealing with the construction of reinforced concrete vessels, attention has always been drawn to the great drawback which results from the increased weight of the hull of these vessels as compared with the weight of hulls of similar dimensions constructed of either steel or wood. This discrepancy becomes greater as the size of the vessel is increased. The advantages of building vessels of moderate tonnage, say up to 1,000 tons displacement, of reinforced concrete are so great that it may safely be asserted that even with the return to normal conditions when the shortage of steel and skilled labour had passed, vessels of reinforced concrete will still continue to be built. There will, however, be a serious attempt on the part of designers and builders to produce a reinforced-concrete vessel in which the weight of the hull will be reduced as nearly as possible to that of a steel ship of the same deadweight capacity, and which will be sufficiently strong and safe, with a thin concrete hull to stand any ordinary knocks, and at the same time have the necessary density to ensure watertightness. This country is not alone in its efforts to solve these problems, and according to the *Zeit*, Paul Zigerli, of Spalato, proprietor of the first Austrian ferro-concrete shipbuilding concern, has succeeded in producing a really remarkable vessel of 150 tons carrying capacity, the entire weight of the hull of which is 72 tons, and the thickness of the sides only 8 cms. ($3\frac{1}{8}$ in.). Unfortunately, further particulars of the method of construction are not given.

Causes of Bad Deliveries.

Almost every item of raw material which is required can now only be obtained after complying with a series of rules and regulations of a more or less complicated character, and the problem of obtaining component parts, *e.g.*, castings, forgings, stampings, &c., is a constant nightmare to the buying department of any engineering firm. There is little doubt but that very many contracts, both large and small, have been and are being hung up through the difficulty of obtaining some relatively small but yet essential item. The position as regards labour is not by any means helpful. The numerous wage awards are unsettling to the men and productive of much controversy and consequent loss of efficiency, and the average output per man would appear to be lower than it was before the war, and markedly less than it was during the first few months of the war. It is greatly to be regretted that attempts to re-awaken the enthusiasm of those early days have not met with much success, for there is need of a revival of energy, and it would be very welcome at the present juncture. Altogether, one cannot but admit that while shipbuilders are often rightly criticised for bad deliveries, there are facts, such as those referred to above, which need to be taken account of in very many cases.

Draughtsmen and Foundry Problems.

The necessity for draughtsmen and engine designers exercising greater care in the design of casting parts of machinery was pointed out by Mr. J. Shaw in a paper read recently to members of the Newcastle branch of the British Foundrymen's Association. The author, in his paper, dealt with the difficulties and worry with which the foundrym n had to contend with in the moulding and casting of complicated parts, in order to minimise the local internal straining actions set up, due to unequal cooling in the mould. This point is not appreciated as it might be by many draughtsmen in their designs, with the result that many castings of doubtful reliability are made owing to possible internal strains, caused by lack of harmony in their constructive elements. Any sudden changes from uniformity in thickness of metal should be avoided as far as possible; where variations in thickness occur, the thicker portion is the last to set and acts as a feeder to the other parts, causing sponginess in the thicker section, which densers and other artifices in common use in foundry practice do not always overcome. Simplicity in structural design should also be aimed at in order to reduce the cost of manufacture. The author dealt with the responsibility of the drawing office in facilitating the output in the foundry; considerable thought had in the past been given to decreasing cost and speeding up of work in the fitting and turning shops, but a knowledge of foundry work was essential in order to obtain the best and cheapest castings.

THE EMIGRATION BILL.

SOME cogent criticisms of the details of the Emigration Bill were made on the occasion of the second reading debate in the House of Commons, but the proposition that more central control of the stream of emigration is needed seems to have been admitted pretty widely. Mr. Hewins, the Under Secretary for the Colonies, who was in charge of the measure, claimed that the Bill neither encouraged nor discouraged emigration, but he expressed the hope that it would be possible to give definite directions and encouragement to the emigration that did take place for the purpose of building up the strength and prosperity of the British Empire. At present we are all in an especial degree conscious of the tremendous aid and encouragement which the self-governing Dominions have given us in the war, and if British people are leaving their homes to seek a livelihood overseas, it is not an unnatural sentiment that we should like them to go to Canada, Australia, South Africa or New Zealand to strengthen the bonds of affection and sentiment. The United States has in the past attracted many immigrants from this country, and the relations with the greater Republic of the West will be made closer by the common fellowship of our Armies on the fields of Flanders and France. Many British people have relatives in America whom they may wish to join. For those reasons, whilst it is right and laudable that those of our people who desire to emigrate should have their thoughts definitely turned to the possibilities of settling in one of the Dominions, it is impossible to place any definite restriction in the way of those who wish to go to the United States. We do not gather that the Bill is designed to offer more than moral encouragement and in some cases material assistance to proceed to one or other of the Dominions.

We described recently the framework of the Bill. Its two main objects are to constitute a Central Emigration Authority and to control various agencies and persons connected with emigration. These questions are of deep interest to shipping companies which are concerned in emigrant traffic. Some particulars of the Central Emigration Authority are given by Mr. Hewins. The Colonial Secretary will be the Chairman. A vice-chairman will be appointed who will give his whole time to the work. Government Departments are to be represented. The High Commissioners of Canada, Australia, New Zealand and South Africa, and two Agents-General representing the Canadian Colonies and the Australian States will have seats on the Authority. A limited number of unofficial members will be appointed, the total membership of the body being 17 or 18. If the authority is to be a practical working concern it ought to contain an adequate representation of shipping interests familiar with emigrant traffic. Otherwise mistakes are bound to arise. As we have formerly mentioned, the authority will collect and disseminate information with reference to emigration, advise and assist intending emigrants, particularly members of the present naval and military forces of the Crown, and advise Government Departments on the matters within its purview. It supersedes the existing Emigrants' Information Office.

Once the principle of central control is accepted, there is a disposition on the part of advocates of the Bill to infer that that admission carries with it the acceptance of the proposed new restrictions on passage brokers and their agents, and of the censorship of literature dealing with emigration. That does not in the least follow. It is quite a valid comment on those provisions that they are complicated and cumbersome and afford many opportunities for officious interference. Moreover, in the background there looms the power of issuing regulations. What they may be the Under Secretary for the Colonies could not say. It is indeed reasonable to secure that a passage broker and his agents shall be respectable men. Mr. Holt contended on Friday that the provisions in the Merchant Shipping Act were already quite ample to secure that. It is now proposed that before issuing a ticket for a steerage passage the broker is to give seven days' notice to the Authority. He must bring to the notice of the intending emigrant certain official publications, and none other. These provisions seem to have been unfortunately framed, for as we read them they may well preclude the communication, say, of contemporaneous articles in the press relating to the country to which the emigrant proposes to proceed.

This point and cognate matters relating to the publication of literature and furnishing information on the part of emigration societies attracted some attention in the debate. Some modifications are clearly deemed desirable. The provisions as they stand would confer, in some respects, a monopoly for officially recognised literature, and it by no means follows that it will invariably be either the most accurate or most recent. Of course it is desirable that grossly misleading information should be withheld from the intending emigrant, but that is quite another matter. Sufficient was said in the course of the debate to show that real points of substance will have to be raised on the Committee stage. Economic conditions at home and abroad will have their effect upon the stream of emigration after the war, and will no doubt govern its dimensions. These in the main will stimulate or check the desire to emigrate; but the problem will be a big one.

THE EDUCATION OF ENGINEERS.

IN view of the fact that despite a certain amount of opposition the House of Commons has decided that the proposals for the development of continuation schools contained in the Education Bill now before Parliament should include certain measures of vocational education, the report of the Committee which was appointed by the Prime Minister in August, 1916, to inquire into the position occupied by natural science in the educational system of Great Britain especially in secondary schools and universities is of exceptional interest, for it may be assumed that the findings of the Committee are certain to be embodied in a greater or a lesser degree in the detailed syllabuses for the continuation classes which will have to be shortly drawn up. The Committee was called upon to advise on what measures are needed to promote the study of natural science, regard being had to the requirements of a liberal education, to the advancement of pure science, and to the interest of the trades, industries and professions which particularly depend on applied science, and the report in so far as it deals with the latter part of this programme is of peculiar interest to engineers since it can safely be asserted that the engineering industry is the one most likely to be beneficially affected by an increased knowledge of the applications of science to industrial processes.

The report, in so far as it deals with this phase of the question, may be divided into two parts, in the first of which the general question of secondary education is dealt with and in the second wherein the application of applied science in technical and engineering education is considered in closer detail. Questions concerned with secondary schools occupy about 30 pages of the report. It is insisted that steps should be taken to secure for all pupils in State-aided secondary schools a school life beginning not later than 12 and extending at least to 16, and the general course of education, including science, for all pupils in public and other secondary schools up to about that age should be followed by more specialised study whether in science or other subjects. In all secondary schools for boys the time given to science should be not less than four periods in the first year of the course, and not less than six periods in the three succeeding years. General education would be benefited if there were no division of schools into sides at the 12-16 stage. For pupils under 16 the science work should be planned as a self-contained course including, besides physics and chemistry, some study of plant and animal life. More attention should be given to those aspects of science which bear directly on the objects and experience of everyday life, and there should be as close correlation as possible between the teaching of mathematics and science at all stages in school work. The " present chaos " of English weights and measures

is declared to cause waste of time and confusion of thought, and it is stated that there are strong educational reasons for the adoption of the metric system. Stress is also laid on the need for insisting all through the science course on the accurate use of the English language. The boy who has been doing an experiment should at least be able to describe what he did and what he saw in simple and comprehensible language in the plain English of educated people.

Having completed his general education at the secondary school the young aspirant to the engineering profession should, if it is possible, proceed to a technical college or a trade school, or else devote part of his time to work in the continuation schools which as laid down in the Education Bill should be held during normal working hours; and from the age of 16 to 18 the report suggests that the amount of time devoted to the subject or subjects on which a pupil is specialising should be not less than one-half or more than two-thirds of the school week. In technical schools and institutions of all grades greater efforts, it is held, should be made to develop and increase the provision of instruction in pure and in applied science, and arrangements should be made for consultation between the various institutions giving secondary and technical instruction in any area. Many more scholarships are required to enable technical students to pass on to the universities, and also to enable boys from junior technical schools (or their equivalent) and from evening schools to enter senior technical schools. The position of junior technical schools in the educational system should be reconsidered. In the proposed continuation classes provision should be made for instruction in science, both in its general aspects and in its bearing on industry, and dealing specifically with engineers a thorough and practical training in mathematics and science is declared to be an essential of the school education; it cannot be replaced, and need not be supplemented, by practice in an engineering workshop at school.

The last portion of the report deals with the supply of trained scientific workers of all grades for industrial and other purposes, which is described as a matter of the utmost gravity and urgency, since for the prosperity and safety of the country after the war the development of the resources of the Empire and the production of our industries must be on a scale greatly in excess of anything we have hitherto achieved. A number of reforms are outlined which must be effected if the supply of scientific workers is to be increased. But it is pointed out that if science is to come by its own the nation as a whole must be brought to recognise the fundamental importance of the facts and principles of science to the right ordering of our national life. The requisite training and opportunities must be provided for those who are capable of advancing natural knowledge or acting as scientific experts, but it is no less important to secure for all who are of an age to receive it an education that will enable them to realise the vital need of a knowledge of science for both the individual and the national well-being.

MODERN CONDENSING SYSTEMS.

THE introduction of the steam turbine for the propulsion of merchant ships, which, consequent upon the rapid improvement in the efficiency of mechanical reduction gearing, bids fair to displace the reciprocating steam engine to a very large extent in standard marine practice, must also lead to a great modification of our preconceived ideas of suitable condensing plant. With the usual type of triple expansion reciprocating engine, an ordinary well-designed cylindrical surface condenser with correctly proportioned air pump and circulating pump was the simplest and most economical combination known which would yield a vacuum of from 26 to 27 in. of mercury; this being recognised as being the most suitable for reciprocating engines. With turbines, however, if the fullest possible advantage is to be obtained from this type of engine, it is essential that higher vacua should be maintained and 28 to 29 in. of mercury is required if the turbine is to operate at its highest efficiency. To produce such high vacua as these the ordinary condensing system outlined above is unsuitable, and as a result many different alternative systems have been adopted by different makers, in all of which a higher vacuum can be obtained without too great an expenditure of steam in the operating of the various pumps and jets employed.

The factor which is of the greatest importance in the production of a high vacuum is air. This air may find its way into the condensing system as a result of leakage through the various joints or glands, but it is probable that the greater proportion of it will be due to the air taken up by the feed water in the hot well, and subsequently entering the condenser with the exhaust. In any case the air becomes more and more rarefied the higher the vacuum which is produced, and the air pump employed must, therefore, be of very large dimensions if it is to perform the duty required of it. In order to avoid using a single large air pump, two-stage air pumps are sometimes employed; at the first stage the air is drawn in at the very low pressure existing in the condenser and led to the second stage at a somewhat higher pressure, where it is dealt with in the ordinary way. The first stage may raise the pressure from 1 lb. per sq. in. absolute to 3 lb. per sq. in. absolute, thus trebling the effect of the second stage pump. The first stage augmenters are often in the form of a jet of steam which carries forward the vapour and air towards the pump by way of a supplementary condenser.

In another system, instead of a two-stage pump two distinct pumps are employed, known as the wet and dry air pumps. The wet air pump draws the condensate from the condenser in the usual way and delivers it to the hot well, while the dry air pump has its suction in such a position that it deals only with air and any uncondensed aqueous vapour. The system, used in conjunction with the Weir "uniflux" condenser, is being employed to an increasing extent on board ship, the improved efficiency obtained from the condenser surface due to the high transmission rate of the circulating water and the peculiar shape of the condenser itself rendering it specially suitable for use with marine turbine installations. In order that the volume of the air dealt with by the dry air pump shall not be excessive on account of its low pressure, its contents are decreased in volume and increased in pressure through cooling by the injection water which is led into the bottom of the dry air pump, circulating continuously and never leaving the system, being cooled in a separate injection water cooler so that it is never subjected to contact with the atmosphere, which would render it liable to aeration. This system is also modified by the employment of steam jets in place of the dry air pump, the result being somewhat the same.

A system of condensation of exhaust steam which is rapidly coming into prominence on account of the high efficiency obtained is the Contraflo Condenser and Kinetic Air Pump system. As the name implies, it consists of a contraflo condenser in which, by the special arrangement of a series of diaphragms or baffles, the path of the steam both before and after condensation and of the air is such that the tube surface is employed at its highest efficiency, the condensate being withdrawn at the highest possible temperature, *i.e.*, as nearly as possible equal to the temperature corresponding to the vapour pressure in the condenser, and the air being withdrawn at the lowest possible temperature by bringing it into contact with the tubes containing the coldest circulating water, so that the volume of air to be dealt with is a minimum. This air is removed from the condenser by the action of a steam jet followed by a special system of water jets, known as a "kinetic" ejector, while the water of condensation is withdrawn from the condenser and discharged against the pressure of the atmosphere by means of two pumps of the centrifugal type, known as the head and the pressure pump respectively.

It will be realised, therefore, that the introduction of the turbine has led to a certain measure of complication in the method of

condensation to be employed. Each of the systems outlined above yield a far higher vacuum than the simple surface condenser system, and there are other systems which cannot be mentioned in the space at our disposal, all of which are known to yield excellent results. It remains, however, in view of the wide adoption of the turbine for marine purposes, for a system to be discovered or for one of the existing systems to be so improved and simplified that marine engineers shall come to regard it as the universally accepted system for producing vacuum with turbines, just as the surface condenser has been recognised as the universal system for use in conjunction with the reciprocating engine.

PUBLICATIONS RECEIVED.

[*A short notice of any publication does not necessarily preclude the subsequent appearance of a longer review.*]

Mensuration Made Easy; or, **The Decimal System for the Million**. By Charles Hoare. London: Effingham Wilson; 54, Threadneedle Street, E.C. 2. $7\frac{1}{4}$ in. × $4\frac{7}{8}$ in. × $\frac{5}{16}$ in. 84 pages. Price 1s. net.

This little work has been drawn up so as to render simple the applications of the metric system to the employments of the artizan and the mechanic, and with that end in view, the author, after explaining the different processes in decimal arithmetic, such as division, &c., illustrates them by problems such as might be met with in engineering practice, particularly in the mensuration of areas and solids. It is suggested by the publishers that in view of the interest taken in Lord Southwark's Decimal Coinage Bill now before the House of Lords that this work should be of special value; but engineers have long recognised the advantages of decimal calculations even if not used with decimal units, and the change would hardly be fraught with the terrors which are sometimes conjured up by opponents of the system. However, for all who are desirous of acquiring the rudiments of decimal arithmetic this little book can be cordially recommended both on account of its lucidity of style and its application of the system to practical rather than academical problems.

Liquid Fuels for Internal Combustion Engines. A Practical Treatise for Engineers and Chemists. By Harold Moore, M.Sc.Tech., F.C.S. London: Crosby, Lockwood & Son, 7, Stationers' Hall Court, Ludgate Hill, E.C. 4. $8\frac{3}{4}$ in. × $5\frac{5}{8}$ in. × 1 in. 200 pp. Cloth, 12s. 6d. net.

A study of the figures quoted in this book of the world's production of crude petroleum for a few recent years helps one to realise how rapid has been the growth of the internal combustion engine, for it may be asserted that the use of fuel oil in the furnaces of boilers has not, save perhaps in the case of naval vessels, been used to any great extent. Thus the world's production in 1901 was 21,709,000 metric tons, in 1911 this was more than doubled at 46,526,334 metric tons, and in 1915 the figure had reached 57,298,786 metric tons. This has naturally led to a shortage of liquid fuels, and since the use of the internal combustion engine for marine purposes shows undoubted signs of increasing rather than decreasing, the question of the production of liquid fuels is one of great importance to the marine engineer. This book then appears at an opportune moment, when the world shortage of petroleum and consequently of its products has led to these becoming of so high a price that engineers and chemists are eagerly exploring other fields with a view to finding other and cheaper sources of liquid fuel. The author of the book under review is of the opinion that the number of possible substitutes for the fuel oils at present principally used is great, and many developments must be forthcoming if the subject receives but the necessary attention and the necessary experimental work, although little by way of suggesting the source of these possible substitutes is given. The production of the various known kinds of liquid fuel is given, together with the means whereby they can be employed in the different types of internal combustion engine, and with the methods of examination and valuation of the various oils in order to test their suitability for use as fuel for internal combustion engines. It may be mentioned that the utilisation of oil for external combustion, *e.g.*, under boilers, is not considered.

The book is thus naturally divided into three parts, the first of which deals with the different kinds of liquid fuel, their production and purification; the second deals with the method of utilisation of the fuel and the suitability of the different kinds of fuel for engines of different types, and the third with the testing of oil fuel in order to determine such essential facts as flash point, sulphur content, calorific value, &c. In the first part the author deals first of all with the occurrence of petroleum and with the various processes for distilling the natural oil in order to obtain the different petroleum products. Shale oil and coal-tar oil are next considered, these perhaps being the most interesting sources of oil at the present time. Lignite tars, and their products, the products of the carbonisation of wood and peat, and animal and vegetable oils are briefly dealt with, and a chapter on alcohol completes this part of the book. The chapter on alcohol is worthy of the closest study, for since alcohol can be prepared without drawing on existing natural sources, it is therefore unlimited in amount, and if it can be economically produced and successfully utilised it may yield a final solution to the motor spirit problem.

In the second part of the book the author classifies engines into those fitted with carburettors, those fitted with vaporisers and those with atomisers, and considers the different kinds of fuel available for each type. In the type fitted with carburettors and vaporisers we have all engines working on the Otto cycle, and the question of the mixture of various oils to form motor spirit will be found of the greatest interest, the author expressing the opinion that this question is as yet only in its infancy. Engines fitted with atomisers include both the Diesel and the semi-Diesel type, and here the problem of the use of tar oils will, in view of recent developments, be found of the greatest interest.

The third part of the book deals with the examination of liquid fuels and with calorimetry, a knowledge of which is of the utmost importance in order to determine the suitability of any particular kind of oil for a given type of engine, or of determining the properties and the calorific value of a proposed substitute. Some useful tables and specifications and an index complete what must be considered as a volume of great value to the ever-growing number of engineers who have to deal with the internal combustion engine or who are in any way interested in its development.

MERCHANT SHIPPING PRECAUTIONS AGAINST ENEMY SUBMARINES.

The following regulation has been made by the Admiralty under the Defence of the Realm Regulations and published in the *London Gazette*:—

1. The master and chief officer of every British merchant vessel of 1,600 tons and upwards, which trades or is likely to trade in any area in which enemy submarines may be encountered, and any person hereafter appointed master or chief officer of any such vessel, shall attend any course of instruction in the precautions necessary to be observed against enemy submarines at such time and place as may be directed by the Admiralty or by any naval officer authorised by the Admiralty to give such directions.

2. Every owner of any such vessel, and where such owner is a company, the managing director or other responsible officer of such company, shall give facilities for the attendance of the master and chief officer in accordance with such directions as aforesaid and shall forward to the Admiralty from time to time such information regarding these officers as the Admiralty may require.

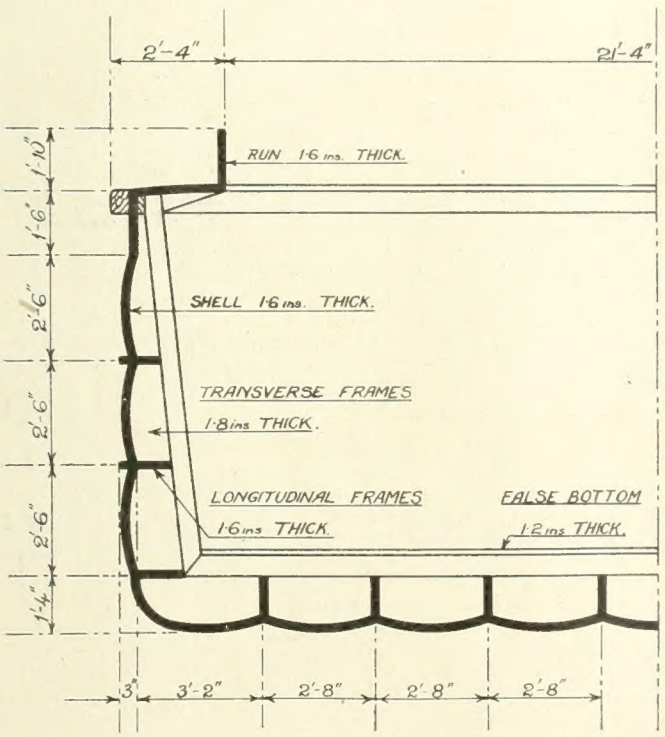
3. If the master or chief officer of any such vessel, to whom such directions have been given, fails or neglects without reasonable cause to comply therewith, such master or chief officer shall not proceed to sea as the master or chief officer of any vessel until he has obtained permission of the Admiralty or of some officer authorised by the Admiralty to give permission.

SHIPS FROM SWEDEN.—A wireless message from Stockholm states that an agreement has been signed between Sweden and the Allies which gives the latter the use of 300,000 tons of shipping, without counting the 100,000 tons already at their disposal. Sweden's compensation is foodstuffs and raw material. The agreement also provides for the reduction of Sweden's export of ore and other materials to Germany.

THE LORTON SYSTEM OF REINFORCED-CONCRETE HULL CONSTRUCTION.

One of the greatest drawbacks to the use of reinforced concrete for the construction of floating vessels is the weight of the hull as compared with the weight of the steel hull required for a vessel of the same dimensions. Another great disadvantage, and one which the steel reinforcement is intended to overcome, is that the concrete is not suited to withstand the tensile stresses which are set up as a result of the hogging or sagging action when the vessel is riding through rough seas.

An ingenious system of reinforced hull construction, known as the "Lorton" system, has recently been employed in France, in which, by the utilisation of the arch principle, both of the drawbacks referred to above are, to a considerable extent, reduced. It is well known that by the employment of an arch in place of a beam the tensile stresses are entirely eliminated, the material of the arch being subjected only to compressive stresses. Hence, in the Lorton system, owing to the reduction of the tensile stresses in the



Midship Section of Barge built on the Lorton Principle.

hull, the amount of steel reinforcement required is very much less and the thickness of the concrete itself is also considerably reduced

According to our French contemporary *Le Génie Civil*, a barge has recently been constructed on this system, having a deadweight capacity of 700 tons, the weight of the vessel when empty being 170 tons, of which the weight of the steel reinforcement is only 12 tons. A half-section of the vessel is reproduced above, in which the curved sides and bottom of the hull are clearly shown. These curves are parabolic, and have been chosen because of their ability to withstand bending pressures and shocks without the introduction of undue tensile stresses, thus permitting, as stated above, a reduction in the amount of steel reinforcement required and a reduction of the thickness of the hull by more than 30 per cent.

The principal dimensions are as follows :—

Length, b.p.	150 ft.
Breadth, overall	26 ,,
,, internal	25 ,,
Depth, internal	10 ,,
Draught, unloaded	2 ,,
,, loaded	10 ,,
Displacement, unloaded	170 tons.
,, loaded	845 ,,

The thickness of the skin is 1·6 in., this being strengthened by transverse beams 1·8 in. thick and longitudinal beam 1·6 in. thick, which form a series of compartments each 2 ft. 8 in. by 2 ft. 6 in., as shown, the longitudinal members being 16 in. high. The whole system is strengthened by four bulkheads, one forward, one aft, and two close together, forming a small compartment 8 ft. 4 in. long amidships, leaving two large holds each 56 ft. 8 in. long by 22 ft. 8 in. wide for the cargo.

The ingenious use of parabolic curves between the longitudinals in the construction of the hull certainly results in a considerable saving in weight, both of steel and concrete, and the further development of this system will be watched with interest. It may be added that the Lorton system has been patented in France and in England.

NAVAL DEVELOPMENT.

At Cambridge, on Saturday last, Lord Milford Haven, who was previously Admiral Prince Louis of Battenberg, received the honorary degree of Doctor of Laws. After the ceremony he delivered the Rede lecture, choosing for his subject "The Royal Navy, 1815-1915."

In a survey of the changes of type, he said the so-called Dreadnought type was a bold step in advance. That ship was designed to carry the largest number of the heaviest guns which could be mounted in revolving turrets, and also to steam at the highest attainable speed. Very soon it was found that the dry docks and basins were not big enough, and that we were putting too many eggs in one basket. If reports were true, it looked as if, since the war began, we had progressed along that road to an alarming extent. After this new battleship there appeared in this country an entirely new class, to which had been given the title of battle-cruiser. In this case the factors of guns and speed were reversed, speed being placed first and the number of guns and the thickness of armour reduced. In this type it looked as if we had become seized with megalomania.

Dealing with scientific equipment, he said that wireless telegraphy had revolutionised naval strategy and had profoundly affected tactics. He expressed approval of the scheme of common entry of candidates for executive and engineering ranks. Ignorant criticism had condemned the scheme as producing jacks of all trades and masters of none, but the exact opposite was the case. Judged by results, the scheme promised very well indeed.

The new century had produced a change in the political outlook. The new naval Power which had arisen in the far corner of the North Sea began to assume formidable proportions with the opening years of the twentieth century, and it became increasingly clear with what object this new fleet was being built up so systematically. Nowhere on the East Coast had we then got dry docks or properly equipped naval bases, although some private shipyards existed. By comparison the German situation was very favourable to her naval requirements, because she had facilities for building, repairing, and equipping every class of ship. The value of Heligoland, however, had been somewhat overrated. The conditions under which it was ceded made this small, flat-topped rock of very little use for naval purposes. The Germans had converted it into a huge fort and constructed a small harbour for torpedo craft. Had we done this it might have become a *casus belli*.

The outstanding feature of the war was the submarine, and our Navy had concentrated energy and ingenuity in destroying these pests of the sea. He prophesied that ultimately we should see submarines of much larger displacement; but progress would not be confined to the enemy Navy.

In paying a tribute to the mercantile marine and the R.N.R., Lord Milford Haven said that 12,000 British merchant seamen had lost their lives by submarine attack, but the survivors were as undaunted and intrepid as ever. The existence of this country now literally depended on the faithful services of these men. Theirs was the spirit of Drake, Hawkins, Rodney, and Nelson.

OVERTIME PAY IN CATERING DEPARTMENT IN HOME PORTS.

The Ministry of Shipping has issued the following particulars relating to the hours of work and overtime pay in the catering department in home ports: (1) Whilst off articles; (2) whilst on "continuous" articles.

1. The following hours of work and rates and conditions of overtime pay for members of the catering department employed on foreign-going vessels in home ports, whilst off articles, have been determined by the National Maritime Board to come into operation on and after Monday, May 13, 1918:—

PASSENGER LINERS.

Working hours.—8 a.m. to 5 p.m., including one hour for dinner; Saturdays, 8 a.m. to 1 p.m. Time worked outside these hours to be paid for as follows:—

Week-days—Boys ... ... 6d. per hour;
Assistant ratings ... ... 1s. 3d. per hour;
Higher ratings ... ... 2s. per hour;
Chief steward, no overtime.

Sunday (*i.e.*, from midnight Saturday till midnight Sunday), Christmas Day and New Year's Day, 6d. per hour extra for all ratings.

CARGO LINERS AND GENERAL TRADERS.

Working hours.—7 a.m. to 6 p.m., including breakfast, three-quarters of an hour, and (except Saturday) dinner, one hour; Saturdays, 7 a.m. to 1 p.m. Time worked outside these hours to be paid for as follows:—

Week-days—Boys ... ... 6d. per hour;
Assistant ratings ... ... 1s. 3d. per hour;
Higher ratings ... ... 2s. per hour;
Chief steward, on vessels carrying 90 hands and over, no overtime.

Sunday (*i.e.*, from midnight Saturday till midnight Sunday), Christmas Day and New Year's Day, 6d. per hour extra for all ratings.

2. With regard to members of the catering department (except the chief steward) on the special form of articles introduced since the war for the use of foreign-going ships, to meet the requirements of the Admiralty and usually known as "continuous articles," it was agreed that in ports of the United Kingdom the daily hours of work, Sunday included, shall be eleven, to be reckoned from commencement of duty in respect of each individual, and to be inclusive of time occupied ($1\frac{3}{4}$ hours in all) for meals.

Time worked in addition, whether on week-days or Sunday, to be paid for as follows:—

Boys ... ... 6d. per hour;
Assistant ratings ... ... 1s. 3d. per hour;
Higher ratings ... ... 2s. per hour;
Chief steward, no overtime.

Where, however, there is an established practice to treat men on these "continuous articles," so far as hours of work and overtime are concerned, as if they were off articles, it is not intended that that practice should be disturbed by the foregoing determination.

It should be noted that apart from the case of the special "continuous articles" mentioned above, no overtime is payable to members of the catering department whilst on the usual forms of articles terminable at the end of each voyage, or on running agreements, or the ordinary six-monthly articles in the home and coasting trades.

ANGLE TABLES.

The two tables which are appended have been drawn up for the use of naval architects, ship draughtsmen, &c., to give the weight per foot, the width of the flanges and the thickness of the angle bars which will be found most suitable for use with plates of various thicknesses, and also the diameters of the rivets that should be employed. Each table is drawn up so as to include angles having equal flanges and those having unequal flanges. The first table is for use with vessels constructed under Admiralty rules and the second is for vessels built in accordance with Lloyd's rules.

ADMIRALTY.

Equal Angles.

Weight of Plate in lb. per sq. ft.	Diameter of Rivet in inches.	Size of Angle.	Thickness of Angle in inches.
$2\frac{1}{2}$	$\frac{1}{2}$	Flanged	—
3–5	$\frac{1}{2}$	$1\frac{1}{2}$ in. × $1\frac{1}{2}$ in. × 1·22 lb. per ft...	$\frac{1}{4}$
6–9	$\frac{1}{2}$	$2\frac{1}{2}$ in. × $2\frac{1}{2}$ in. × 4·04 lb. per ft...	$\frac{1}{4}$
10–15..	$\frac{5}{8}$	3 in. × 3 in. × 7·17 lb. per ft. ..	$\frac{3}{8}$
16–20..	$\frac{3}{4}$	$3\frac{1}{2}$ in. × $3\frac{1}{2}$ in. × 9·76 lb. per ft...	$\frac{7}{16}$
$22\frac{1}{2}$–$27\frac{1}{2}$	$\frac{7}{8}$	4 in. × 4 in. × 11·25 lb. per ft. (or 5 in. × 5 in. × 16·15 lb. rivets reeled).	$\frac{7}{16}$, $\frac{1}{2}$
30–$37\frac{1}{2}$	1	4 in. × 4 in. × 15·67 lb. per ft. (or 5 in. × 5 in. × 16·15 lb. reeled).	$\frac{5}{8}$, $\frac{1}{2}$
40–50..	$1\frac{1}{8}$	$4\frac{1}{2}$ in. × $4\frac{1}{2}$ in. × 14·45 lb. per ft. (or $5\frac{1}{2}$ in. × $5\frac{1}{2}$ in. × 26·14 lb. reeled).	$\frac{1}{2}$, $\frac{5}{8}$
Over 50	$1\frac{1}{4}$	$4\frac{1}{2}$ in. × $4\frac{1}{2}$ in. × 14·45 lb. per ft. (or 6 in. × 6 in. × 37·4 lb. reeled).	$\frac{1}{2}$, 1

Unequal Angles.

Weight of Plate in lb. per sq. ft.	Diameter of Rivet in inches.	Size of Angle.	Thickness of Angle in inches.
$2\frac{1}{2}$	$\frac{1}{2}$	Flanged	—
$2\frac{1}{2}$—(3–5)	$\frac{1}{2}$—$\frac{5}{8}$	$1\frac{1}{2}$ in. × $1\frac{1}{2}$ in. × 1·22 lb. per ft...	$\frac{1}{4}$
(3–5)—(6–9)	$\frac{5}{8}$—$\frac{1}{2}$	$2\frac{1}{2}$ in. × $1\frac{1}{2}$ in. × 3·19 lb. per ft...	$\frac{1}{4}$
(6–9)—(10–15) ..	$\frac{1}{2}$—$\frac{5}{8}$	3 in. × $2\frac{1}{2}$ in. × 6·53 lb. per ft. ..	$\frac{3}{8}$
(6–9)—(16–20) ..	$\frac{1}{2}$—$\frac{3}{4}$	$3\frac{1}{2}$ in. × $2\frac{1}{2}$ in. × 8·27 lb. per ft...	$\frac{7}{16}$
(6–9)—($22\frac{1}{2}$–$27\frac{1}{2}$) ..	$\frac{1}{2}$—$\frac{7}{8}$	4 in. × $2\frac{1}{2}$ in. × 9·02 lb. per ft. ..	$\frac{7}{16}$
(10–15)—(16–20) ..	$\frac{5}{8}$—$\frac{3}{4}$	$3\frac{1}{2}$ in. × 3 in. × 7·81 lb. per ft. ..	$\frac{3}{8}$
(10–15)—($22\frac{1}{2}$–$27\frac{1}{2}$) ..	$\frac{5}{8}$—$\frac{7}{8}$	4 in. × 3 in. × 9·76 lb. per ft. ..	$\frac{7}{16}$
(10–15)—(30–$37\frac{1}{2}$) ..	$\frac{5}{8}$—1	4 in. × 3 in. × 13·55 lb. per ft. ..	$\frac{1}{2}$
(10–15)—(40–50) ..	$\frac{5}{8}$—$1\frac{1}{8}$	$4\frac{1}{2}$ in. × 3 in. × 17·21 lb. per ft...	$\frac{1}{2}$
(10–15)—Over 50 ..	$\frac{5}{8}$—$1\frac{1}{4}$	$4\frac{1}{2}$ in. × 3 in. × 19·71 lb. per ft...	$\frac{1}{2}$
(16–20)—($22\frac{1}{2}$–$27\frac{1}{2}$) ..	$\frac{3}{4}$—$\frac{7}{8}$	4 in. × $3\frac{1}{2}$ in. × 10·51 lb. per ft...	$\frac{7}{16}$
(16–20)—(30–$37\frac{1}{2}$) ..	$\frac{3}{4}$—1	4 in. × $3\frac{1}{2}$ in. × 14·61 lb. per ft...	$\frac{1}{2}$
(16–20)—(40–50) ..	$\frac{3}{4}$—$1\frac{1}{8}$	$4\frac{1}{2}$ in. × $3\frac{1}{2}$ in. × 18·49 lb. per ft.	$\frac{1}{2}$
(16–20)—Over 50 ..	$\frac{3}{4}$—$1\frac{1}{4}$	$4\frac{1}{2}$ in. × $3\frac{1}{2}$ in. × 21·20 lb. per ft.	$\frac{1}{2}$
($22\frac{1}{2}$–$27\frac{1}{2}$)—(30–$37\frac{1}{2}$)	$\frac{7}{8}$—1	4 in. × 4 in. × 15·67 lb. per ft. ..	$\frac{1}{2}$
($22\frac{1}{2}$–$27\frac{1}{2}$)—(40–50) ..	$\frac{7}{8}$—$1\frac{1}{8}$	$4\frac{1}{2}$ in. × 4 in. × 19·76 lb. per ft...	$\frac{1}{2}$
($22\frac{1}{2}$–$27\frac{1}{2}$)—Over 50..	$\frac{7}{8}$—$1\frac{1}{4}$	$4\frac{1}{2}$ in. × 4 in. × 22·68 lb. per ft...	$\frac{1}{2}$
(30–$37\frac{1}{2}$)—(40–50) ..	1—$1\frac{1}{8}$	$4\frac{1}{2}$ in. × 4 in. × 19·76 lb. per ft...	$\frac{1}{2}$
(30–$37\frac{1}{2}$)—Over 50 ..	1—$1\frac{1}{4}$	$4\frac{1}{2}$ in. × 4 in. × 22·68 lb. per ft...	$\frac{1}{2}$
(40–50)—Over 50 ..	$1\frac{1}{8}$—$1\frac{1}{4}$	$4\frac{1}{2}$ in. × $4\frac{1}{2}$ in. × 24·17 lb. per ft.	$\frac{1}{2}$

LLOYD'S.

Equal Angles.

Thickness of Plate in inches.	Diameter of Rivet in inches.	Size of Angle and thickness in 20ths and 40ths of an inch.	Weight of Angle in lb. per linear ft.
·22–·34	$\frac{5}{8}$	3 × 3 × $\frac{13}{40}$	7·17
·34–·48	$\frac{3}{4}$	$3\frac{1}{2}$ × $3\frac{1}{2}$ × $\frac{9}{20}$	10·02
·48–·66	$\frac{7}{8}$	4 × 4 × $\frac{9}{20}$ (or 5 × 5 × $\frac{10}{20}$ rivets reeled).	11·55, 16·15
·66–·88	1	4 × 4 × $\frac{25}{40}$ (or 5 × 5 × $\frac{10}{20}$ rivets reeled).	15·67, 16·15
·88–1·14	$1\frac{1}{8}$	$4\frac{1}{2}$ × $4\frac{1}{2}$ × $\frac{10}{20}$ (or $5\frac{1}{2}$ × $5\frac{1}{2}$ × $\frac{15}{20}$ rivets reeled).	14·45, 26·14
1·14–1·20	$1\frac{1}{4}$	$4\frac{1}{2}$ × $4\frac{1}{2}$ × $\frac{10}{20}$ (or 6 × 6 × 1 rivets reeled).	14·45, 37·40

Unequal Angles.

Thickness of Plate in inches.	Diameter of Rivet in inches.	Size of Angle and thickness in 20ths and 40ths of an inch.	Weight of Angle in lb. per linear ft.
(·22–·34)—(·34–·48)	$\frac{5}{8}$ & $\frac{3}{4}$	$3\frac{1}{2}$ × 3 × $\frac{13}{20}$	7·81
(·22–·34)—(·48–·66)	$\frac{5}{8}$ & $\frac{7}{8}$	4 × 3 × $\frac{9}{20}$	10·02
(·22–·34)—(·66–·88)	$\frac{5}{8}$ & 1	4 × 3 × $\frac{25}{40}$	13·55
(·22–·34)—(·88–1·14)	$\frac{5}{8}$ & $1\frac{1}{8}$	$4\frac{1}{2}$ × 3 × $\frac{14}{20}$	17·4
(·22–·34)—(1·14–1·20)	$\frac{5}{8}$ & $1\frac{1}{4}$	$4\frac{1}{2}$ × $3\frac{1}{2}$ × $\frac{25}{40}$	21·20
(·34–·48)—(·48–·66)	$\frac{3}{4}$ & $\frac{7}{8}$	4 × $3\frac{1}{2}$ × $\frac{9}{20}$	10·79
(·34–·48)—(·66–·88)	$\frac{7}{8}$ & 1	4 × $3\frac{1}{2}$ × $\frac{25}{40}$	14·61
(·34–·48)—(·88–1·14)	$\frac{7}{8}$ & $1\frac{1}{8}$	$4\frac{1}{2}$ × $3\frac{1}{2}$ × $\frac{13}{20}$	18·49
(·34–·48)—(1·14–1·20)	$\frac{7}{8}$ & $1\frac{1}{4}$	$4\frac{1}{2}$ × $3\frac{1}{2}$ × $\frac{25}{40}$	21·20
(·48–·66)—(·66–·88)	$\frac{7}{8}$ & 1	$4\frac{1}{2}$ × 4 × $\frac{25}{40}$	15·67
(·48–·66)—(·88–1·14)	$\frac{7}{8}$ & $1\frac{1}{8}$	$4\frac{1}{2}$ × 4 × $\frac{13}{20}$	19·76
(·48–·66)—(1·14–1·20)	$\frac{7}{8}$ & $1\frac{1}{4}$	$4\frac{1}{2}$ × 4 × $\frac{25}{40}$	22·68
(·66–·88)—(·88–1·14)	1 & $1\frac{1}{8}$	$4\frac{1}{2}$ × 4 × $\frac{13}{20}$	19·76
(·66–·88)—(1·14–1·20)	1 & $1\frac{1}{4}$	$4\frac{1}{2}$ × 4 × $\frac{25}{40}$	22·68
(·88–1·14)—(1·14–1·20)	$1\frac{1}{8}$ & $1\frac{1}{4}$	$4\frac{1}{2}$ × $4\frac{1}{2}$ × $\frac{25}{40}$	24·17

THE FIRST FINNISH VESSEL.—*Hansa* announces that, on May 7, the first Finnish merchant steamer flying the national flag entered Lubeck (from Abo), in order to take on cargo for Finland. "Thus is re-established direct sea traffic with Finland."

INCREASES OF CAPITAL IN SWEDEN.

The larger Swedish owners have adopted a far-seeing financial policy during the war and most of them are again undertaking capital increases. The Sweden-America-Mexico line founded with £77,000 capital in 1914, which was raised to £232,000 in 1917, has now increased its capital to £464,000. The "Baltic" firm (Gothenburg) has increased its capital from £77,000 to £221,000; and the Baltic-France concern, founded in Gothenburg in 1915, has trebled its original capital of £75,000. The Viking company which raised its capital from £25,750 to £55,000 in 1915, undertook a further increase to £110,000 in 1917 and is now issuing another £60,500.

The capital of the Swedish Lloyd, only £107,200 in 1914, is now ten times as great. The Falkvik company, founded at Solvesborg in 1916 with a share capital of £25,000, has now a capital of £82,800. The Ester company (Norrkoping) started in 1914 with a capital of £7,430, which was raised to £11,200 in 1916 and twice increased in 1917 to its present amount, £53,300. The Salvage company Neptun (Stockholm), which operated profitably even in peace time, had a capital of £138,000 in 1914, which was raised to £193,000 in 1916, and later to £231,000 and £347,500; the company anticipates an abnormal amount of salvage business after the war.

The Swedish Farmers' Union (shipowners) started in 1916 with £82,500 capital, which is now raised to £211,000. A similar spirit of enterprise is to be found even amongst the smaller owners and despite all difficulties. On the other hand, new owners are less frequently encountered.

NAVIGAZIONE GENERALE ITALIANA, GENOA.—This company is increasing its capital from £4,750,000 to £7,150,000.

AUXILIARY MOTOR SCHOONER "MARTHA."

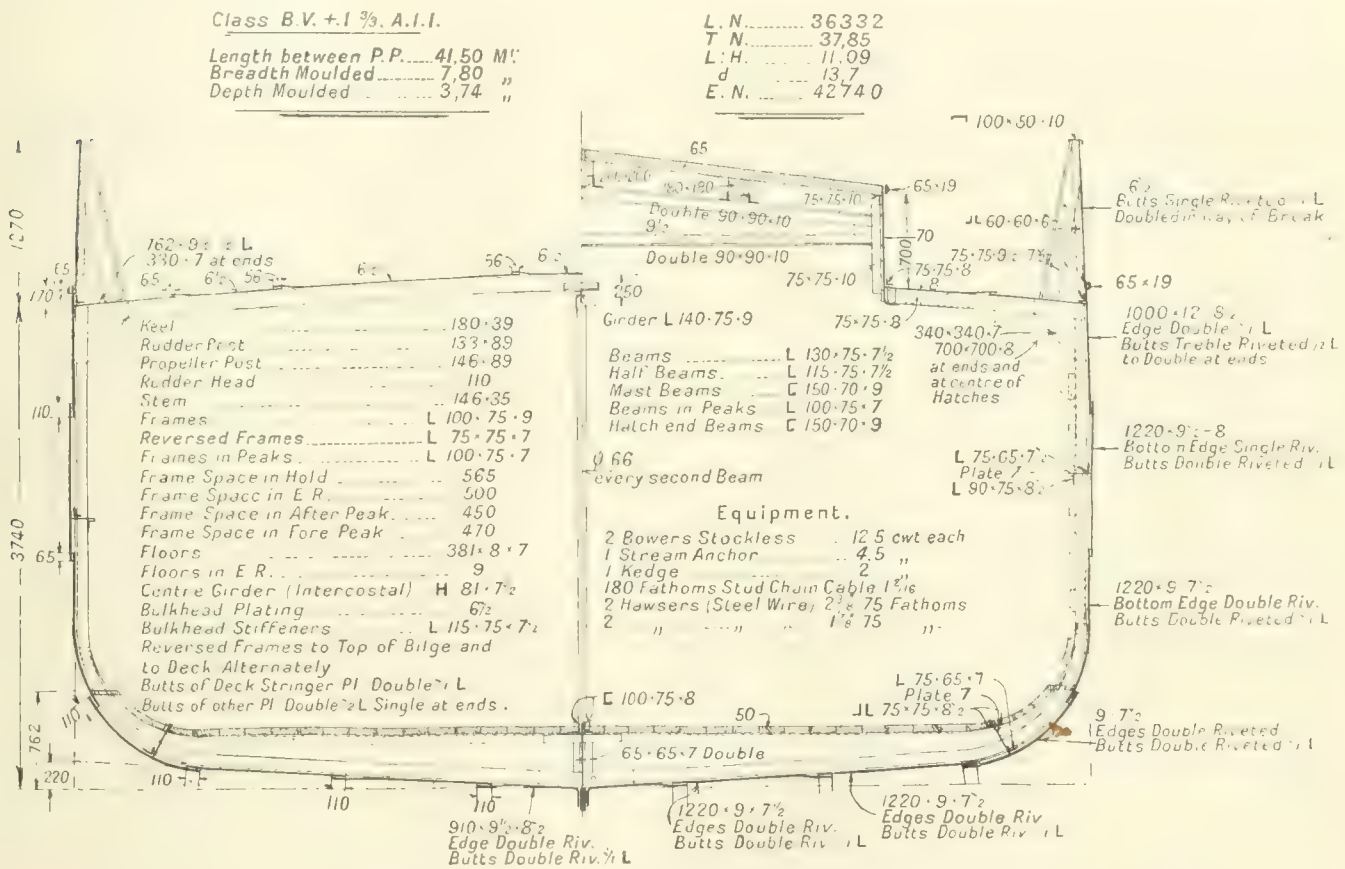
The three-masted motor schooner *Martha* was built by the "Zeeland" Shipbuilding Company, Ltd., Hansweert, Holland, for the "Vrachtvaart My Neerlandia," Rotterdam, and is one of a series of similar vessels which are being built in Holland for the same company.

The principal dimensions are as follows:—

Length, overall	150 ft. 6 in.
,, between perpendiculars	136 ft.
Breadth, moulded	25 ft. 6 in.
Depth, moulded	12 ft. 3 in.
Draught, extreme from lowest point of keel ...	11 ft. 3 in.
Deadweight (approx.)	450 tons

The main features of the vessel can be seen from the general arrangement drawings reproduced on pages 626 and 627, from which it will be observed that the vessel is rigged as a three-masted fore and aft schooner, and that she carries a small oil engine for use in periods of calm or when working against a head wind. This engine is of the two-cylinder Kromhout heavy oil type of 130 h.p., having cylinders 15¾ in. diam. by 17¾ in. stroke, which runs at 240 r.p.m. and is capable of giving the vessel a speed when loaded of 6 knots. The fuel consumption is about 0·49 lb. per horse-power per hour. On this type of engine water injection to the cylinder is omitted so that the wear and tear of the cylinder and piston is greatly reduced; the makers claim further that the consumption of lubricating oil is also very low and the working of the motor considerably simplified. To start up the engine external lamps or "preheaters" are required, one for each cylinder, but these are not required when once the engine has got thoroughly under way. Two fuel oil tanks, each of 5·5 tons capacity, are built in the engine-room.

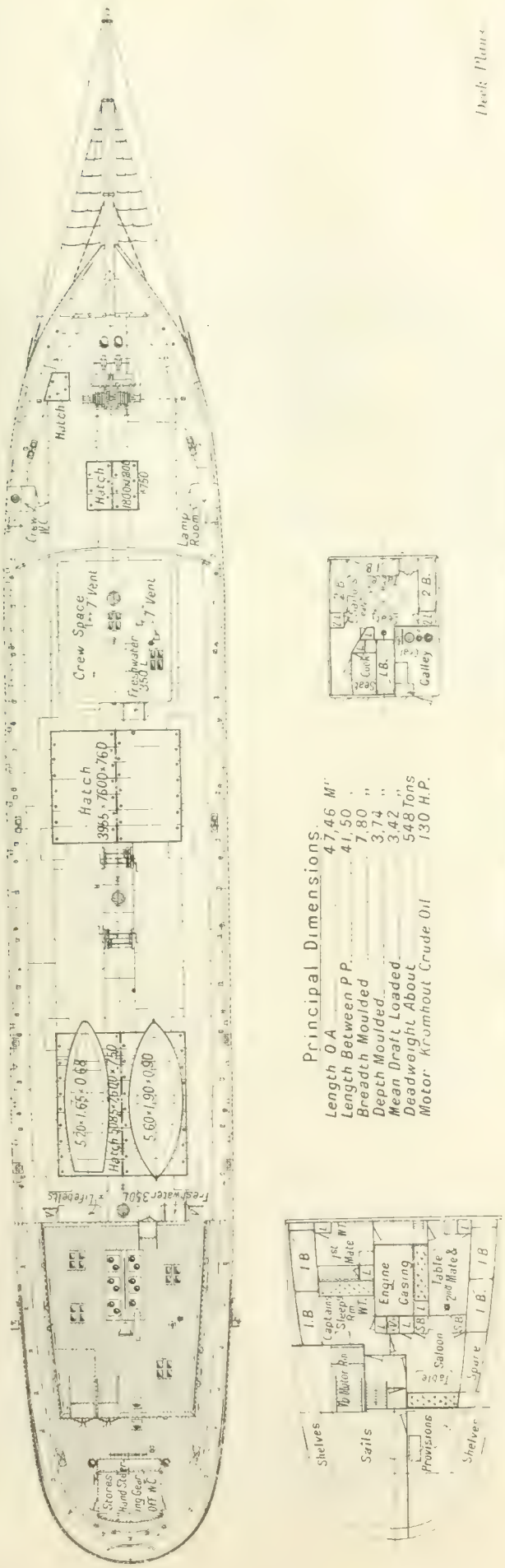
The details concerning the construction of the vessel and the


Class B.V. +1 3/3, A.I.I.
Length between P.P. 41,50 M.
Breadth Moulded 7,80 "
Depth Moulded 3,74 "
L.N. 36332
T.N. 37,85
L:H. 11,09
d 13,7
E.N. 4274 0
Keel 180·39
Rudder Post 133·89
Propeller Post 146·89
Rudder Head 110
Stem 146·35
Frames L 100·75·9
Reversed Frames L 75·75·7
Frames in Peaks L 100·75·7
Frame Space in Hold 565
Frame Space in E.R. 500
Frame Space in After Peak 450
Frame Space in Fore Peak 470
Floors 381×8·7
Floors in E.R. 9
Centre Girder (Intercostal) H 81·7½
Bulkhead Plating 6½
Bulkhead Stiffeners L 115·75·7½
Reversed Frames to Top of Bilge and to Deck Alternately
Butts of Deck Stringer Pl Double ½ L
Butts of other Pl Double ½ L Single at ends.
Girder L 140·75·9
Beams L 130·75·7½
Half Beams L 115·75·7½
Mast Beams C 150·70·9
Beams in Peaks L 100·75·7
Hatch end Beams C 150·70·9
Ø 66 every second Beam
Equipment.
2 Bowers Stockless 12 5 cwt each
1 Stream Anchor 4.5 "
1 Kedge 2 "
180 Fathoms Stud Chain Cable 1⅝
2 Hawsers (Steel Wire) 2½ 75 Fathoms
2 " " 1⅜ 75 "
340×340·7
700×700·8 at ends and at centre of Hatches
L 75·65·7 Plate 7
L 90·75·8½
C 100·75·8
65×65·7 Double
L 75·65·7 Plate 7
JL 75·75·8½
100×50·10
65×19
JL 60·60·6
Double 90·90·10
75·75·10
75·75·8
1000×12 8½ Edge Double ½ L Butts Treble Riveted ½ L to Double at ends
1220·9·7½ Bottom Edge Single Riv. Butts Double Riveted ½ L
1220·9·7½ Bottom Edge Double Riv. Butts Double Riveted ½ L
9 7½ Edges Double Riveted Butts Double Riveted ½ L
910·9½·8½ Edge Double Riv. Butts Double Riv. ½ L
1220·9·7½ Edges Double Riv. Butts Double Riv. ½ L
1220·9·7½ Edges Double Riv. Butts Double Riv. ½ L

Midship Section, Auxiliary Motor Schooner "Martha."

AUXILIARY MOTOR SCHOONER "MARTHA."

Profile.



General Arrangement of Auxiliary Motor Schooner "Martha."

particulars of scantlings of the various parts, together with the equipment, is given in the midship section reproduced on page 625. The vessel has been constructed under special survey and to plans approved by the Bureau Veritas.

The captain's and officers' accommodation is in the deck-house aft, the seamen and the cook being in the deck-house forward. The cabin accommodation consists of a saloon, the captain's room, officers' rooms and mess room. The saloon is panelled in polished mahogany.

A few particulars of the work of the "Zeeland" Shipbuilding Company, Ltd., will prove of interest. The company's shipyard is located on the river Schelde, about 25 miles from Flushing, and it was laid down in 1908. From that time up to 1914 the work of the company consisted mostly of tugs, small ships for coasting trade and of cranes. As a result of the demand for tonnage caused by the war, the "Zeeland" Shipbuilding Company, Ltd., as did so many other companies in Holland, extended their yard and decided to build cargo vessels of a larger type than hitherto, and by filling in a piece of submerged land the yard was extended by about 25 acres. Two reinforced concrete berths were made enabling the company to build ships up to 6,000 tons deadweight. On one of these new berths the keel is laid for a shelter deck cargo steamer of 2,900 tons deadweight for the Svenska Lloyd of Gothenburg. This vessel is to be equipped with Ljungstrom turbo-electric machinery of 1,400 h.p.

THE ECONOMICS OF SHIP REPAIRS.

(FROM A CORRESPONDENT.)

The managers of some of the ship repairing establishments around the coast will have some interesting jobs to describe when conditions permit, as the extent and variety of the work they have tackled during the past two years have been far in excess of any, except "freak" jobs, which were taken in hand in pre-war days. The relatively low cost of new tonnage then rendered it uneconomical to undertake any repairs which were more than reasonably lengthy and difficult, with the result that vessels were broken up which nowadays would fetch a very substantial figure even before repair. Under the system which has been set up during the past year, the fullest possible advantage can be taken of the resources of the many repairing firms, from those of large size down to the smallest and least well-equipped. As a consequence the speeding up of repair work has been very marked, and it is difficult to estimate the value of the work the Department responsible for repairs has accomplished.

Now that there is a centralised control of repair work, it would appear practicable and also very desirable to adopt some means of disseminating such information as might be of value, regarding the manner in which certain important repairs have been effected. There is a "best" way of tackling every job—of course, dependent on the plant and equipment available—and from experience of the many repairs which have been carried out, it should be possible to arrive at the "best" method rapidly in the case of any new job. So far as one is aware, there is no such scheme for spreading useful information in this country, although everyone who has read the detailed accounts of the repairs made by the Americans to the damaged German merchant vessels, cannot but be impressed by the probable value of these reports to firms who may be confronted with the work of making good somewhat similar damage. There must be very numerous cases in which damage to a vessel due to mine or torpedo has resulted in the fracture of important hull and machinery castings, and it would be very instructive to have some idea of the manner in which these damaged items have been repaired. It is probable that the very large majority of such fractures have been made good by furnishing replace parts rather than by actually repairing the castings themselves. The policy of

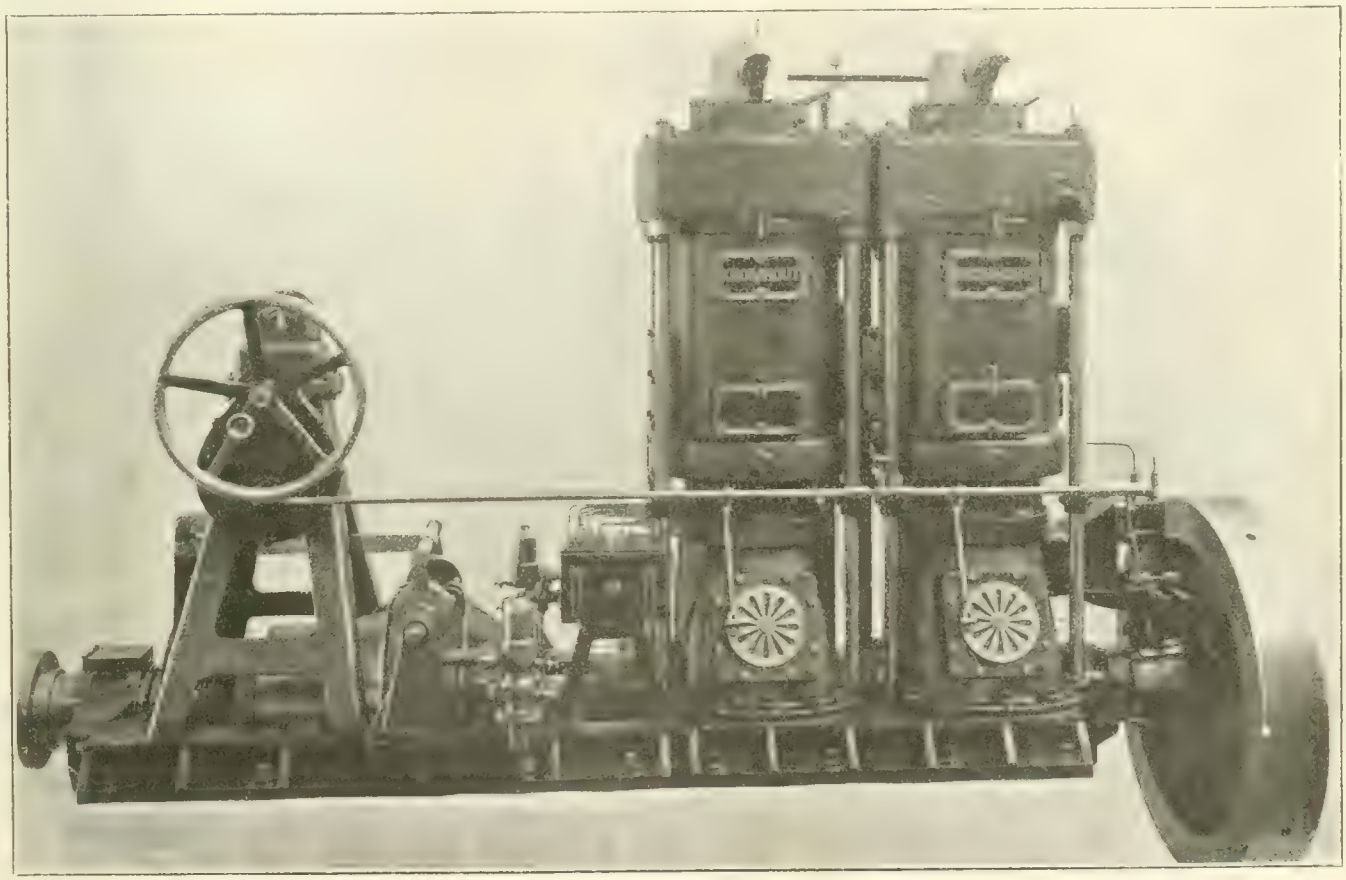
Auxiliary Motor Schooner "Martha" ready for Launching.

Three-Masted Fore and Aft Schooner "Martha," fitted with Auxiliary Motor. (*See page* 625.)

ordering replace castings instead of making good the broken ones, is open to many objections. In the first place it is usually very wasteful of time, as such new parts have to be put through foundries already crowded with work for new vessels. Further, the length of time required for turning out a new casting is usually considerable, even if the job is given very first attention, while this latter procedure often results in a very uneconomical dislocation of the normal run of work in the foundry. It is often necessary to patch up an old or to make a new pattern, no easy task where a stern frame or similar large part is required, while work at the vessel in the vicinity of the damaged casting is hung up until such time as the new casting has been delivered. The period for such delivery is rarely short and it may run into four or five months.

Where it is even remotely possible to effect a sound "war-time" repair by any of the several methods which can be adopted, there is no doubt but that the attempt should be made. It may not be possible to maintain the full strength of the original casting in the repair, but if a right sense of balance and proportion is brought to the consideration of the job, there is little doubt but that very many repairs which would have been considered as "not quite" satisfactory in peace time will be undoubtedly accepted as amply good enough under present conditions. After all one cannot help feeling that there is very little justification for putting, say, a brand new stern frame into a vessel which is only good for another few years, when the broken frame previously in the vessel could have been repaired sufficiently to ensure its outlasting other parts of the hull, or to put the matter in another way, when repair to the broken frame would have resulted in the factor of safety on the repaired frame being at least equal to the factor of safety in other parts of the ship. A vessel has a certain factor of safety when built, which factor applies more or less uniformly to the whole of the major portions of the ship structure. Deterioration naturally results in a reduction of this factor, and there are undoubtedly many vessels now on service in which the factor of safety in some portions of the vessel is very little more than one.

As there are several methods by which it is possible to repair castings so as to obtain not less than 60 to 80 per cent. of the original strength, it would appear desirable that very careful attention should be paid to the possibility of effecting repair to the damaged item, and a replace part ordered only if it is found essential having regard to the whole circumstances of the case. Demands on foundries are so large that everything possible should be done to relieve them. It may be thought that delay would be involved, should it finally prove absolutely necessary to order a replace casting, owing to the time spent in considering the question as to whether or not the old casting could be repaired, but this could be avoided if all the work preliminary to ordering the casting was carried out while this matter was under consideration. Further, if the services of experts in say electric welding and thermit welding were obtained it should be possible to rapidly arrive at sound conclusions.



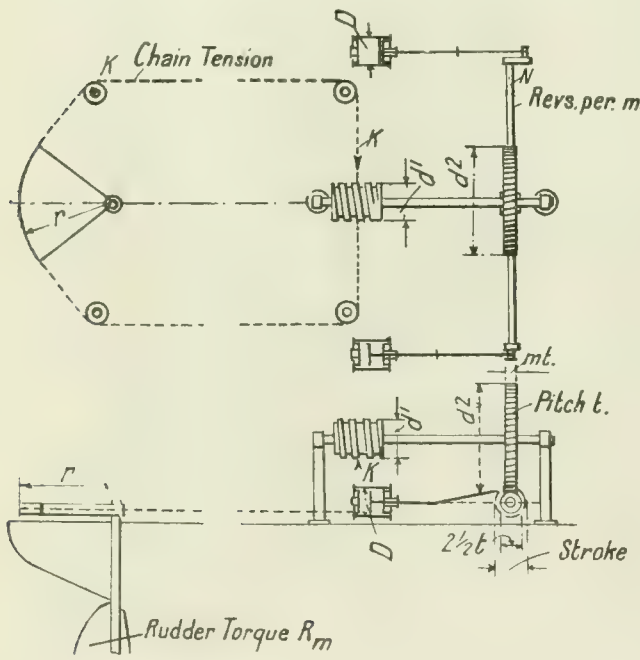
130-H.P. Kromhout Oil Engine for Auxiliary Motor Schooner "Martha." (*See page* 625.)

U.S. SHIPWRIGHTS' PATRIOTIC ACTION.—According to the New York correspondent of *The Times*, the Shipwrights and Joiners' Union of Seattle have adopted resolutions waiving Saturday half-holidays and the double pay for them for June, July and August. To the above decision Mr. Everit Macy, Chairman of the Labour Adjustment Commission of the United States Shipping Board, sent the following reply:—"Please convey the expression of our warm appreciation of, and hearty congratulations on, the action of the Shipwrights and Joiners' Union. This evidence of high patriotism heartens us all, and is the spirit that assures our winning the war." The Metal Trades Council of Portland, Oregon, has taken action similar to that announced by the Shipwrights and Joiners' Union. To both Unions President Wilson has telegraphed congratulations.

DIMENSIONS OF STEAM STEERING ENGINES.

Literature concerning the calculation of cylinder sizes for steam steering engines is very scanty, hence the subjoined formula is a welcome addition to the designer's note-book. This simple formula permits direct determination of the cylinder dimensions and several interesting points are brought to light in the course of its evolution from first principles. In its original form the formula was published recently in *De Ingenieur*, but for the greater convenience of readers, it is here modified to suit English weights and measures.

The following groups of variables have to be taken into consideration:—(1) Known magnitudes such as rudder pressure, rudder torque, radius of quadrant, pull in chain, and available steam pressure. (2) Magnitudes which really belong to (1) but are generally not known to the designer. These are: Maximum rudder deflection; time for laying rudder hard over, from side to side, against full rudder pressure; and the corresponding revolutions of the steering wheel. The usual values for these three factors are 45 deg., 30 seconds, and 7 to 10 revolutions respectively. (3) Magnitudes which may be varied within limits at the discretion of the designer. These are: Diameter of chain drum or cable sheave; permissible bending stress in the worm-wheel teeth; diameter and pitch of the worm; ratio of diameter to stroke in the steam engine;



General Lay-out of Steering Gear.

efficiency of the latter; friction loss in the various bearings; and, finally, the revolutions per minute of the engine. Excepting the engine speed, the above factors are defined fairly closely by various practical considerations and not much difference is produced in the final result even by working to the extreme limits of these variables.

The general lay-out of the steering gear assumed below is illustrated above. The crankshaft drives a worm which meshes with a worm-wheel on the chain-drum shaft. This simple gear is the one in most extensive use, and the result finally reached below is easily modified to suit apparatus including additional gears, by adding factors expressing the frictional loss in the latter.

The symbols adopted in the following formulæ are:—R = rudder pressure in lb. (by Rankine, Weisbach, Middendorf or Joessel's formula); A = rudder torque in lb.-inches; r = quadrant radius (inches); L = length of chain corresponding to full rudder deflection $=(\pi r/2)$ inches. Also, K $(= A/r)$ = pull in chain in lb.; $2p$ = steam pressure, lb. per square inch; t = pitch of worm-wheel in inches; $(mt.)$ = tooth width in inches; $2\frac{1}{2}t$ = diameter of worm; d_1 = diameter of chain drum on pitch circle (inches); d_2 = diameter of worm-wheel on pitch circle (inches).

We have first, that the tooth pressure on the worm is $P = K.d_1/d_2$ ... (1). The tooth pitch is given by the formula $P = cbt$, where c is a coefficient depending on the permissible bending moment, or by $P = cmt^2$, which, combined with equation (1), gives $t^2 = Kd_1/cmd_2$ ... (2). To lay the rudder right over from one extreme position to the other requires $(L/\pi d_1)$ revolutions of the chain drum, and these, being completed in $\frac{1}{2}$ min., correspond to $(2L/\pi d_1)$ r.p.m. If the engine makes N r.p.m., the number of teeth on the worm-wheel corresponding to a single-thread worm is: $n = (N\pi d_1\lambda/2L)$ ... (3). Also, $n = (\pi d_2/t)$ ... (4), so that equating the right-hand portions of (3) and (4) and substituting the value of t from (2), we have: $d_1/d_2 = (4cm/K)^{\frac{1}{3}} \times (L/N)^{\frac{2}{3}}$ ... (6). The tangential force exerted on the worm-wheel by the worm is: T = tooth pressure × tan $(a + \lambda)$, where a = slope of worm thread; tan $a = (t/\pi \cdot 2\frac{1}{2}t) = 0.127$; and λ = angle of friction μ = tan λ where μ = co-efficient of friction. Hence $T = P$ (tan $a + \mu$)/(1 — μ tan a) = 0.315 P = 0.315 (Kd_1/d_2)lb. ... (7). Allowing for 10 per cent. friction in the bearings, the torque to be exerted on the crankshaft is: $M = 1.1\ T\ (2.5t/2)$ in.-lb. ... (8), and, knowing this torque, the cylinder diameter is best derived from the simple formula: $D = \sqrt[3]{[(4\ M\lambda)/(p\ \eta\ g)]}$ in. ... (9), where p is the mean effective steam pressure, and may be taken to be half the boiler pressure, for although the engine works with full cut-off, there is great loss of pressure in the long pipe line and condensation in the cylinders during stand-by periods. The efficiency η of the engine in (9) may be taken as 70 per cent.; and the ratio g of stroke to cylinder diameter may be taken provisionally as unity.

It will be seen that equation (9) assumes that the whole estimated resistance will have to be overcome at times by a single cylinder (cranks at 90 deg.). This errs somewhat on the side of safety, but it must be remembered that the ordinary formula for rudder pressure does not give the full resistance to be overcome when the rudder is put over whilst the ship is turning in the opposite direction. The actual rudder resistance then varies with the square of the speed of the ship; allowance cannot easily be made in the formula for the speed of turning of the vessel, but this and other contingencies are covered by making the engine cylinders full large. Substituting values for M, T, t and (d_1/d_2) from equations 2, 6, 7, 8 in equation (9) and simplifying, we obtain $D = 1.71\ \sqrt[3]{[(KL)/(Np)]}$ ... (10), in which expression there is no mention of c or m, so that the cylinder diameter is independent of the breadth of gear teeth and of the bending stress permitted in them.

Again, $(KL) = (K\pi r/2) = (\pi A/2)$ lb.-in., hence equation (10) can be written: $D = 2\ \sqrt[3]{(A/pN)}$ very nearly ... (11). Assuming the boiler pressure, $2p$, to be 150 lb.: $D = 0.47\ \sqrt[3]{(A/N)}$ ... (12), where A is the rudder torque in lb.-inches and N is the engine revolutions per minute. It is thus clear that the diameter of the engine cylinder is independent of the quadrant radius, the diameter of the chain drum and the diameter of the worm-wheel. Of the various assumptions made in arriving at this result, the most important is that the diameter of the worm is $2\frac{1}{2}$ times its pitch; should this be considered unsuitable, the above formulæ may be modified easily to suit whatever other diameter: pitch ratio be chosen. Generally, the engine is run at about 200 r.p.m. in order to keep the diameters of steam pipe and worm-wheel within reasonable limits. Substituting this value for N, the formula for D reduces to $D = (0.08\ \sqrt[3]{A})$ in. ... (13). Once D is obtained, the ratio of worm-wheel to chain-drum diameter, the tooth pitch and other quantities can be calculated from equations already given above. The outstanding point is that the dimensions of a steam steering engine, under the reasonable assumptions specified, depend only on the rudder torque and engine speed.

SHIPYARD APPLIANCES.

THE "HUWOOD" PORTABLE COMPRESSED-AIR TURBINE-DRIVEN CENTRIFUGAL PUMP.

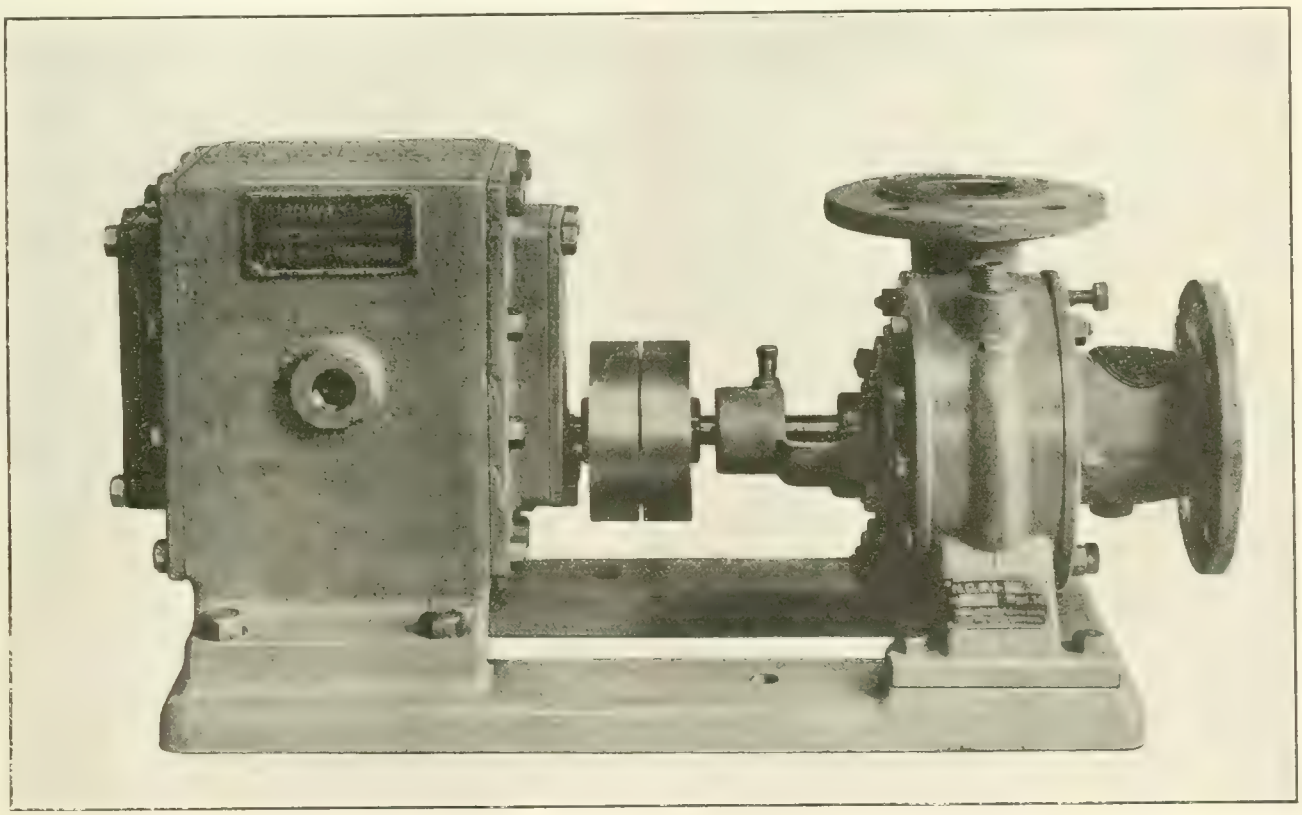
In practically every shipyard a compressed air system is installed at various parts of the yard for operating the pneumatic drills, hammers, &c., and the service is usually laid along each building berth, particularly for the operation of pneumatic riveters and caulkers, and for the many jobs which can be so conveniently and expeditiously performed by means of tools operated with compressed air. It is certain, however, that in very few yards is the utmost use made of this extremely valuable source of power, and many different operations in the construction and equipment of a ship now done by hand might undoubtedly be far more quickly and cheaply performed with the aid of suitably designed pneumatic tools. Amongst these operations we may mention the pumping out of the small quantities of water which invariably accumulate in the bilges, tanks and other parts of the vessel during the time she is on the stocks, and this must either be allowed to remain where it accumulates or be bailed out or pumped out by hand.

A very convenient form of pump has, however, been recently put upon the market by Hugh Wood & Co., Ltd., Newcastle-upon-Tyne, for coping with circumstances similar to those instanced above. This pump, which is known as the "Huwood" Portable Compressed-Air Turbine-driven Centrifugal Pump is, as its name implies, a pump of the centrifugal type, driven by a turbine operated with compressed air, the whole set being of such a size and weight that it can readily be moved from one part of the yard to another as required. It has been designed for handling small quantities of water up to about 90 gallons per minute, and to work against heads up to about 80 ft. The set, a photograph of which we reproduce on this page, consists essentially of a single stage centrifugal pump, coupled direct to a turbine driven by compressed air, both being mounted on the same cast-iron bed-plate as shown.

The overall dimensions of the complete unit are 24 in. long by 12 in. wide by 12 in. high, and the weight is about 2½ cwt., and it will be readily understood that its small weight and size enable it to be readily moved from place to place, while the fact that it is driven by compressed air, which is extremely safe and simple to deal with, makes it specially suitable for shipyard work where a compressed air supply is available at many parts of the yard and at different points along the slipways. There are many situations in shipyards where the work has to be carried out in the open, and in which portable electrical machinery is not so reliable owing to the severe conditions under which it has to operate. In addition, a compressed air supply needs far less skilled attention than does an electric power supply.

The turbine is of very simple construction, consisting primarily of two rotors with stepped teeth, there being no delicate valves, nozzles, fine blades or buckets employed in its construction, the only valve in connection with the machine being the air inlet valve, which is connected to a ¾-in. diameter hose pipe; there are thus no small and troublesome parts to get out of order and to need frequent repair or renewal. Due to the shape of the rotor teeth, the air is used expansively, and the makers claim that the consumption of air is so small that there is not enough pressure at the exhaust to extinguish a candle, the movement of air from the exhaust being barely perceptible when the pump is working up to its capacity. The rotors are mounted on ball bearings, so that the amount of friction and wear is reduced to a minimum. The turbine will work satisfactorily at any air pressure between 50 and 100 lb. per sq. in., thus corresponding to the pressure usually found in shipyards, and will develop up to 5 h.p. according to the pressure employed and the speed, the speed of the turbine automatically adjusting itself to that required for the quantity of water and the head against which it is being delivered.

The pump is of the single-stage Sulzer centrifugal type, and is connected to the turbine driving shaft by means of a flexible coupling of the rubber pin type. The pump casing is provided with a filling



The "Huwood" Compressed-Air Turbine-Driven Centrifugal Pump.

funnel to enable it readily to "pick up" its water. It will work under many different conditions, the maximum suction lift being 20 ft., the maximum delivery lift 74 ft., and when running at a speed of about 3,020 revolutions per minute will pump up to 95 gallons of water per minute, which is approximately 24 tons per hour, the size of the suction and the delivery nozzles being each 2½ in. internal diameter.

It is interesting to note that these pumps have been installed and are in successful operation at some of the largest shipbuilding and ship-repairing yards in the country.

SPANISH SHIPPING.

The development of Spanish shipping during the war has been very similar to that occurring in Norway, the tonnage available being insufficient to meet the requirements of the many new schemes brought forward. Since the outbreak of war, up to the end of 1917, more than 30 new firms of shipowners have been established in Spain with a total capital exceeding £3,180,000; whereas, before the war, there were only about 40 owners, with a little over £3,960,000; at the end of last year the paid-up share capital of all Spanish shipping companies amounted to about £9,130,000.

Simultaneously with the foundation of new shipping companies, the tonnage of the Spanish mercantile marine decreased to a considerable extent, principally owing to vessels being sold to foreign owners. Compared with a total tonnage of about 900,000 tons in June, 1915, the Spanish mercantile marine had decreased to slightly over 700,000 gross tons by the beginning of this year. The output of Spanish yards has been increased considerably, but still hardly covers losses by ordinary marine casualties. The principal factor retarding output is the difficulty in obtaining engines. There is good reason to expect improvement in this respect in the near future. Most of the new owners have hitherto bought vessels from older concerns or taken over coasting vessels and set them to work on long-distance traffic. The scarcity of coastal tonnage resulting from this policy has become so acute that State interference has been necessary.

OIL FUEL IN EGYPT.

It has long been known that petroleum exists beneath the soil in various parts of Egypt, although until quite recently attempts to work it had not met with any large measure of commercial success. It is apparent, however, that if such an attempt were successful, the fact that Egypt stands upon the highway to India, to Australia, and to the East, would render the circumstance of prime importance to the Navy and to the merchant service in view of the increasing use of oil for the raising of steam or for operating internal-combustion engines. That such a successful production of oil is within the realm of possibility is suggested in the course of a Note by the Acting Financial Adviser in Egypt on the Egyptian Budget for 1918, in which it is pointed out that at the beginning of the war the Anglo-Egyptian Oilfields, Ltd., was the only one of the various companies that remained in operation. But a new field discovered in 1914, at Hurghoda, has been proved to be of very regular formation, and its yield has steadily increased until it now stands at over 15,000 tons of crude oil per month. Meanwhile, the Suez refinery has been enlarged, and there is every reason to hope that increased supplies of fuel oil will soon be available. In view of the possibilities we have suggested above, future developments will be watched with interest.

Italian Wooden Ship Construction.—According to an Exchange message from Rome, the Italian Director-General of Naval Construction announces that only 36,000 tons of wooden ships were built in the first months of the year owing to lack of materials. Now, however, construction is proceeding on a much vaster scale.

ADVANTAGES AND DEFECTS OF FERRO-CONCRETE SHIPS.

The following brief review of advantages and defects of ferro-concrete ships is given in the *Board of Trade Journal*:—

"The first large concrete vessel ever produced in this country will shortly pass into the service of the Government. She has a displacement of about 900 tons, and a deadweight carrying capacity of some 400 to 500 tons. She follows the lines of an ordinary steel ship, and has a pleasing appearance. This is an interesting craft as her production marks what may prove to be the inauguration of a new era in shipbuilding. The idea of a concrete ship is not new Some 70 years ago a Frenchman, M. Lambot, patented the idea and produced a concrete rowing boat. Some 40 years later a sloop was built in Holland, which has been in use ever since. Recently the Admiralty—owing to the exceptional circumstances obtaining—have given a fresh stimulus to the production of these vessels. Accurately to designate the class, one should term them ferro-concrete, or reinforced concrete ships. This means that a steel skeleton is employed, which is packed round and filled in with concrete. Concrete is strong under compression, but has little or no tensile strength. This defect is therefore counterbalanced by 'reinforcing' with steel rods. Different systems are adopted, but the general principle of getting the steel portions of the vessel into position, and then packing the concrete round them, is followed in all.

"The principal advantage of ferro-concrete ships is that they meet the pressing needs of the moment. Much less steel is required, which in itself is of inestimable value at the present time. The proportion of saving varies with the size of the ships; the larger the ship the less the saving. On a 5,000-ton ship the saving in steel would probably not exceed about 30 per cent. On a small vessel over 50 per cent. might be saved. If a hundred 1,000-ton ships were built in ferro-concrete a saving of some 10,000 tons of steel might be looked for. Two further important advantages are cheaper and quicker construction. Another weighty consideration is that labour other than that of skilled shipwrights can be successfully employed. Again, the necessary shipyard plant is cheaper, simpler, and more easily installed, whilst the materials for making the concrete are available in almost any locality.

"One of the main defects is the greater weight, which, type for type, approaches 100 per cent. increase. It follows that there is a proportionate increase in displacement for a given deadweight. Where deadweight freightage is a governing factor, the concrete ship can only compare unfavourably with the steel vessel. Where 'bulky' articles have to be carried, the point is not so important. Commercially, of course, any increase of net tonnage involves further expenditure for port and harbour dues. Then, again, bad weather has a greater delaying effect when concrete ships are being built than when steel is used. Another difficulty is that encountered in launching, as the increased weight adds to the dangers normally attendant on that operation.

"From the foregoing brief review, it will be seen that many points of advantage in the ferro-concrete vessel are more than doubly valuable under present circumstances. Their utility as a war-time expedient is unquestionable. This is particularly the case in regard to the smaller vessels now being produced in this country.

"A large ocean-going vessel of 5,000 tons was recently launched at San Francisco. The development of the use of ships of this size and the question of the commercial future of concrete vessels are matters which may be left for the future to decide."

U.S. Ships Launched in May.—According to an Exchange message from Washington, the Shipping Board announces that 15 steel and three wooden ships, aggregating 109,700 tons, were launched during the week ending May 25. So far 30 steel and 25 wooden vessels have been launched in May.

GENERAL NEWS SECTION.

PERSONAL.

THE BIRTHDAY HONOURS.

The list of Birthday Honours, the first instalment of which appeared on Monday, promises to be a long one and will not be exhausted until, in the case of certain sections of the Order of the British Empire, until September; the first O.B.E. list will be published next Saturday.

Among the peerages Baron Rhondda becomes a Viscount and Sir W. J. Tatem, Bart., a baron. The new knights include Mr. T. O. Callender, managing director of Callender's Cable & Construction Company, Ltd., and Mr. T. W. Lewis, stipendiary magistrate, Cardiff, and Senior Wreck Commissioner. Vice-Admiral Sir Rosslyn E. Wemyss, First Sea Lord of the Admiralty, receives a G.C.B., Sir Owen Philipps, Chairman of the R.M.S.P. and associated companies, a G.C.M.G., and Sir H. Acton Blake, Deputy Master, Trinity House, a K.C.M.G. Viscount Rhondda, prior to his elevation to the peerage, was Mr. D. A. Thomas, and as "D. A." he still figures in most people's minds. The leading personality in the Cambrian coal combine, with a finger in most pies in South Wales, and in a good many outside that area, Lord Rhondda has become known throughout the country by virtue of his office of Food Controller. The new honour conferred on him is a small tribute to the inestimable services he has rendered to the Empire. Sir W. J. Tatem, Bart., is one of the best known figures in the Bristol Channel shipping circles. In 1907 he was chairman of the Cardiff Shipowners' Association. He is chairman of the Tatem Steam Navigation Company, Ltd. Sir William has, in the words of the official communication, placed "the Universities of Wales on a permanent and secure foundation" and has made "generous contributions to the National Welsh Museum at Cardiff and the National Welsh Library at Aberystwith."

Lord Rhondda,
Created a Viscount.

Sir W. J. Tatem,
Created a Baron.

Sir Owen Philipps,
Who receives a G.C.M.G.

Sir Rosslyn Wemyss,
Who receives a G.C.B.

Mr. C. E. Furness, a director of Furness, Withy & Co., Ltd., has been dangerously wounded by shrapnel.

Mr. John M. Paton, shipowner and shipbroker, of Glasgow, who died on November 12 last, has left personal estate in the United Kingdom valued at £18,714.

The Cardiff District Committee of the Shipping Federation, Ltd., have re-elected Mr. W. W. Jones as chairman. Mr. D. P. Barnett, Mr. J. Emlyn Emlyn-Jones, Mr. W. E. Hinde, Mr. F. Jones, Mr. D. Radcliffe, Mr. Ivor Richards, and Mr. W. Smith have been elected to the executive sub-committee.

Lieutenant G. I. Turnbull, fourth son of Mr. Philip Turnbull, Cardiff, who was taken prisoner by the Germans on April 9 last, has died of wounds. He had been recommended for the Military Cross. Lieutenant Turnbull was chartering clerk to Mann, George & Co., Cardiff.

Mr. R. M. Sutton, Chairman of the North of England Steamship Owners' Association, has been appointed Shipping Adviser to the Naval Transport Officers of the Tyne, Blyth and Wear District. He is a member of the firm of Stephens, Sutton & Stephens, shipowners, Newcastle.

Lieutenant W. Stanley Hinde, a Cardiff docksman, has received an important appointment at General Headquarters, France. Lieutenant Hinde was before the war with Lambert Brothers, Ltd., and is the son of Mr. R. T. Hinde, of the Cardiff Shipping Store Company, Ltd., and a nephew of Mr. W. E. Hinde, shipowner, Cardiff.

Captain F. J. Lane, of the steamship *Buranda*, and Captain T. O. Shaddick, of the steamship *Dorie*, at a meeting of the Cardiff District Committee of the Shipping Federation were presented each with a diploma and gold medal, awarded by the Shipping Federation in recognition of their services in combating attacks made by enemy submarines. Captain Lane has already been awarded the Distinguished Service Cross, and each has received Lloyd's silver medal.

Captain Lobb, the master of a Bristol Channel ship, has been awarded the D.S.C. for a successful engagement with a submarine on his seventy-fifth birthday.

Mr. John Rees, Superintendent of the Llanelly Harbour Trust, has tendered his resignation, having received an appointment under the Ministry of Reconstruction.

On behalf of Spillers and Bakers, Cardiff, Mr. W. E. Nicholls presented the following awards to the captain, officers, and crew of one of their boats, in recognition of their services in defeating an enemy submarine:—F. W. King (master), £20; A. Rogan (chief engineer), £10; S. Guncil (mate), £10; D. Campbell (boatswain), £5 and £20 look-out reward; C. Hunt (second engineer), £5; S. Williams (steward), £5; and seven members of the crew £5 each.

Lieutenant B. W. George, R.N.R., D.S.O., was presented at the Cardiff Exchange, with the diploma of the Shipping Federation for valorous conduct. He will also receive in due course a medal presented by the Federation. When in command of the *Tredegar Hall*, Lieut. George successfully fought an enemy submarine for three hours, and was severely wounded in the encounter. He was also presented by Sir Edward Nicholl, on behalf of the owners of the vessel (The Hansen Shipping Company, Ltd.) with a gold watch.

Mr. J. Graham, who has been a surveyor under the Board of Trade at Leith for about seven years, has been promoted to a position at Dundee. Prior to leaving Leith Mr. Graham was made the recipient last week of a number of handsome presents from friends connected with the shipbuilding and shipping industries at Leith. Mr. Urquhart, of Menzies & Co., shipbuilders, presided over a large gathering, and the presentation was made by Captain Tait, who referred in eulogistic terms to the ability and tact displayed by Mr. Graham during his official career at Leith.

Lieut.-Commander C. K. Sergent, R.N.R., was the recipient, at Cardiff, of a cheque and certificate of honour, granted by the Carnegie Hero Trust Fund, in recognition of his services in rescuing six members of a vessel in distress in a heavy gale. The Board of Trade medal for gallantry in saving life at sea was presented to Lieut.-Commander Sergent by the King on April 20 last. He is a freeman of the City of Newcastle and a Deputy Master of Trinity House. Previous to taking up his present position in Cardiff he was engaged on the examination service.

Mr. Robert Mason, who has been returned M.P. for the Wansbeck Division of Northumberland in succession to the late Mr. Charles Fenwick, who held the seat in the Liberal-Labour interest for over 32 years, is one of the best known figures in shipping circles on Tyneside. He is an ex-chairman of the North of England Steamship Owners' Association. In public life Mr. Mason occupies a leading place, being an alderman of Northumberland County Council. When he appeared on 'Change after his victory he was heartily congratulated by the Lord Mayor. Mr. Mason said he particularly appreciated the warm congratulations accorded him by his Quayside friends.

Mr. Thomas Rome, Chairman of the Pacific Steam Navigation Company, presided, on Friday, at a gathering at the company's offices, when Captain F. H. Hobson, of the company's steamer *Oronsa*, was presented with an illuminated vote of thanks, a medal, and binoculars, given by the Liverpool Shipwreck and Humane Society, in recognition of the promptitude and skill with which he acted in saving his passengers and crew after his steamer had been torpedoed by an enemy submarine. Mr. F. C. Danson (Chairman of the Society) made the presentation, and made the interesting announcement that the Liverpool War Risks Association had, after investigating the circumstances under which the torpedoing of the vessel took place, recognised Captain Hobson's ability and promptitude by awarding him the sum of one hundred guineas and a special vote of thanks. Mr. Danson added that Captain Hobson by his prompt action had succeeded in saving 260 lives, of whom 110 were passengers.

German Interest in Swedish Yard.—According to *Schiffbau*, a yard which will be large (as judged by Swedish standards) is to be erected at Ronneby, near Carlscrona, under the joint support of Swedish and German capitalists. Supplies of engines and raw materials will be secure. It is proposed to erect from six to eight slipways for large vessels up to 10,000 tons; about 2,000 men will be employed. The proposed share capital is £660,000.

FROM OUR CORRESPONDENTS.

CLYDE DISTRICT.

(From Our Own Correspondent.)

Scottish Steel Trade.—Perhaps the most satisfactory feature of the steel trade at the present time is that shipbuilders' requirements are being fully met from week to week, large as these requirements are. The steelworks are being pressed, however, for orders of a high priority, and in small sized sectional material and also in ship plates the demand continues urgent. The fuel position, which shows little sign of improvement, gives cause for some anxiety. In recent months the output of the collieries has fallen off owing to the withdrawal of men, and the matter is having the attention of the Coal Controller, who expects to introduce a priority scheme for the distribution of the available supplies of fuel, so that essential industries, such as the steel trade may not be adversely affected. A scheme for the rationing of coal to domestic consumers, which will be introduced almost immediately, will, it is expected, leave larger supplies for industrial purposes.

Dry Dock Facilities at Greenock.—The Greenock Harbour Trust, at their next meeting, will have under consideration a proposal to let the Garvel Graving Dock to a large shipbuilding firm in the district. Some negotiations have already taken place on the subject between the Trust and the shipbuilders concerned, and it is probable that the arrangement which has already been provisionally been made between the two parties will come up for confirmation by the Trustees. The Garvel basin is the largest of the three publicly-owned graving docks at Greenock. There are other two basins which are the property of shipbuilding firms. The Garvel dock is 635 ft. in length and 60 ft. 9 in. in breadth. A peculiarity of the dock is that the sides of the entrance slope inwards, a feature which renders it rather unsuitable for admitting large steamers of modern build. The trustees, however, propose to alter the entrance as soon as the work can be conveniently carried out.

Labour Dispute at Ayrshire Ports.—Steps have been taken by the Committee on Production to effect a settlement of the dock labour dispute which has arisen at the principal ports on the Firth of Clyde. Last week the men employed at Ayr, Ardrossan, Irvine and Troon came out on strike, but before the end of the week a settlement was effected with the workers at Ardrossan. The dispute arose over the operation of the national award by which advances were granted to dock labourers at all the principal ports in the country. The men claimed that the advance given to weekly and tonnage workers is not equivalent to the 2d. per hour granted to casual time workers under the award. Some local questions have also arisen regarding the interpretation of a previous piecework award. When the matter was brought to the notice of the authorities the Chief Industrial Commissioner telegraphed to the effect that the Committee on Production were prepared to deal with the matter provided the men resumed work at all the ports concerned.

The Scottish Ship Canal.—Since the beginning of the war, if not before it, there has been a general impression abroad in Scotland that the Government fully intended at some future date to commence the construction of a ship canal across central Scotland. The announcement made last week to the effect that the Government have no such intention has come therefore as a surprise to many people. It must be admitted, however, that some prominent Clyde shipbuilders have all along considered the project as impracticable on the ground that the enormous cost of constructing such a canal would be out of all proportion to either the commercial or strategic advantages which might be gained. Such important bodies as the Clyde Navigation Trust and the Glasgow Chamber of Commerce have taken very little part in the propaganda work in favour of the proposed canal for the same reasons. The project had, however, a large measure of support from local authorities, including the Town Councils of Glasgow and Edinburgh, and also from many private interests in the country. As has frequently been stated, two routes were suggested, the more popular of which was that known as the "direct route" along the valleys of the River Bonny and the River Kelvin. The other route, which lay by way of Loch Lomond, had the advantage, however, of being thoroughly surveyed by a private firm and its claims placed fully before the Admiralty. The party which has supported the "direct route" are not inclined to accept the Government's decision as final, and in

this connection a meeting was held in Edinburgh on Monday for the purpose of formulating an appeal to the Government to order a thorough survey of the route by the Bonny and Kelvin Valleys. A number of municipalities, including those of Glasgow and Edinburgh, were represented at the meeting.

NORTH-EAST COAST DISTRICT.

(FROM OUR OWN CORRESPONDENT.)

Shipyard Committees.—The new shipyard committees for the acceleration of output have been appointed, and there are hopes that they will accomplish good work. Each committee is composed of five representatives of the workmen and five of the firm, and its main functions are to prepare monthly estimates of production, consider hindrances to output and lost time, and exercise a supervisory interest in carrying out schemes arranged by district joint committees, which comprise five employers and five trade union officials. This latter committee is linked up with a national joint committee appointed by the Shipbuilding Employers' Federation and the Shipyard Trades, and thus the whole industry is in the hands of men directly concerned in it, and if they cannot bring about a larger output of tonnage it is useless to look elsewhere for expert advice and guidance.

Rutherford College Wireless School.—Excellent results continue to be obtained at the wireless school in connection with Rutherford College, Newcastle, which was equipped by local shipowners. At a meeting of the College Radio Society, in honour of students who have recently qualified and are about to take up appointments in the wireless service, it was stated by the chief instructor, Mr. William D. Owen, that of twenty candidates who were lately examined nineteen had qualified for certificates. Tyneside boys have come forward in large numbers to avail themselves of the facilities offered for obtaining instruction in wireless telegraphy, and it may be truthfully said that a great deal of the success already achieved has been due to the painstaking efforts of the teaching staff and their capacity for making "wireless" attractive and appealing to the imagination of youth.

North of England Steamship Owners' Association.—Condolence and congratulation intermingled at the last meeting presided over by Mr. R. M. Sutton. Sincere regret was recorded at the death of the Duke of Northumberland, who for eight years was president of the association, a position now occupied by his son, the new Duke, and felicitations were extended to Mr. Arthur Scholefield upon his election as chairman of the Tyne Improvement Commission in succession to the late Sir William H. Stephenson. The cordial co-operation of the association was offered to Mr. Scholefield in any matters affecting the welfare of the river. Among other items of general interest considered at the meeting was a circular from the Assistant Secretary to the Board of Trade intimating the approval of that Department and the Food Controller of a suggestion which had been made that vessels trading to meat-producing countries should take on board, when opportunity offered abroad, sufficient live stock to supply themselves with meat during the voyage to this country.

THE MERSEY DISTRICT.

(FROM OUR OWN CORRESPONDENT.)

Reduction of Capital.—A petition of David MacIver & Co., Ltd., shipowners of this port, for the reduction of the capital of the company from £170,000 to £100,000 by the paying off of £75,000 worth of preference shares was granted last week by the Lancashire Chancery Court at Liverpool. The petitioners stated that the company had accumulated out of profits a reserve fund of upwards of £129,000, and this sum is to be applied, so far as is necessary, for that purpose.

Shipyard Strike.—A further stoppage of, roughly speaking, about 1,400 men employed at H. & C. Grayson's shipbuilding yard at Garston took place on Monday this week over the question of the employment of the one non-union man which caused a temporary strike three weeks ago. The union men claim that this man should either become a member of the union or be dispensed with, and a truce of three weeks was arranged for this purpose. It is expected that efforts to effect a settlement of the dispute will be successful.

Fencing a Hatchway.—An interesting point affecting shipowners was decided in the Liverpool Court of Passage last week when it was held that the Blue Star Line, Ltd., were not negligent in not fencing a hatchway in their ship *Broadmead*, down which one of their workmen fell, and sustained serious injuries, while the ship was being refitted as a cold storage ship. The contention urged on behalf of the shipping company that they were only compelled to fence a hatch during the process of loading, unloading and bunkering, was therefore upheld, and judgment given in their favour.

Atlantic Passenger Fares.—Precisely what is to be achieved by the advance of from 50 to 80 per cent. in North Atlantic passenger fares, which is being effected "by direction of the Ministry of Shipping," cannot be learned from the best informed sources, but if it is expected to bring in a greatly increased revenue to meet the increases of Blue Book rates to shipowners there will, with the present falling off in the number of passengers carried, be some disappointment for that Department. One thing it is certain to do is to place British lines at a disadvantage with Allied and neutral competing lines which, as far as is known, are not putting up their rates in the same manner. The passenger carrying lines feel that this is a matter that should have been viewed from an international point, and if an increase is at all desirable, it should have been made common to all by previous agreements. The public, however, need to be assured that this advance in the rates is not of the shipowners' seeking, but has been imposed by direction of the Ministry of Shipping, who authorises an increase of £12 on the minimum first-class rates; an advance of £7 on the minimum cabin or second-class rates; and an advance of £5 on the third-class rates which in each case were in operation in July, 1914.

SOUTH WALES DISTRICT.

(FROM OUR OWN CORRESPONDENT.)

The New Blue-Book Rates.—The new Blue-Book rates were brought up at a meeting of the Cardiff and Bristol Channel Shipowners' Association, when Sir Wm. Seager said that shipowners had a lot to be thankful for to the "Blue Book" Committee of the Chamber of Shipping. The committee had done most laborious work in getting the Ministry of Shipping to agree to the new rates and in preparing a vast amount of statistical matter. Sir Wm. Raeburn, in particular, had worked very hard, and had been a valuable negotiator on their behalf. The Ministry of Shipping were now prepared to legislate for any cases of hardship. The meeting expressed appreciation for what had been done by the committee.

Claim for Compensation.—At Cardiff, on Thursday last, Judge Hill-Kelly had before him a peculiar compensation case. Edith May Boyle sought to recover £300 under the Workmen's Compensation Act for the loss of her husband. The applicant married a coloured man, and he was killed while acting as a fireman on board a Cardiff steamer which was torpedoed. The owners, in the ordinary way, admitted their liability by letter and submitted to an award. From subsequent facts that had come into their possession they ultimately contested the claim on the ground that the applicant was not a dependent at the time of death. His honour gave judgment for the defendants, but reserved his decision as to the effect of the letter, which primarily admitted liability in respect of the death of the husband.

Boys for the Mercantile Marine.—The following resolutions were adopted at a meeting of the Cardiff and Bristol Channel Shipowners' Association on Thursday last:—(1) That the association support the Education Bill as providing general and technical education. (2) That the action of the Shipowners' Parliamentary Committee in appointing a special committee to deal with the Bill be approved of. (3) That the association pledge their support to that committee in its endeavours to secure that the Bill shall not operate to stop or hinder the offer of boys for the mercantile marine, to secure for boys who intended to enter the mercantile marine the equivalent of continuation education, and the settlement before the Bill passes of a scheme to be agreed with shipowners which shall guarantee the foregoing. (4) That the association demand that provision shall be made in the Bill suspending the operation of the Act as regards boys in, or intended for, the mercantile marine until such scheme has become effective in the opinion of the Merchant Shipping Advisory Committee to the Board of Trade.

Sir William Seager, in moving the resolutions, said that the Education Bill now before Parliament merited the serious consideration, not only of shipowners, but of the general public. The mercantile marine required about 9,000 boys a year in order to adequately man

these vessels without relying on foreigners. The Bill compelled all boys to attend continuation classes from 14 to 18 years of age, which endangered the supply of boys who were desirous of making the sea their profession at a time when interest in the sea was keenest. An endeavour was being made by shipowners at Cardiff to encourage boys to train for positions in the mercantile marine. A number of Cardiff shipowners were putting extra accommodation on their ships. The Education Bill provided that boys were to be retained up to 18. The experience of most owners showed that 15 was the age at which boys liked to go to sea, and it was the age at which sea training was most easily acquired. Unless special provision was made the boys would be forced to spend the most valuable years of their lives in learning an entirely different occupation. They would therefore lose a very large number of these boys. Keen interest in this particular subject was taken by Captain W. R. Smith, who had kept in touch with the Principal of the Cardiff Technical College in connection with a scheme for providing the necessary nautical instruction to lads who wished to train as officers in the mercantile marine.

Shipbrokers' Charges.—The following letter has been received by Mr. S. W. Hansen, chairman of the Bristol Channel Shipbrokers' Institute, from Sir Ernest Glover, the Director of the Ship Management Branch of the Ministry of Munitions, in regard to the fees paid on requisitioned neutral vessels:—In reference to the circular recently sent to you authorising the payment on these vessels of £15 15s. to brokers in lieu of brokerage, and to cover clearance and agency, a number of inquiries have been received as to whether this fee is to include fittage on bunkers, and other items. I therefore beg to state that it is clearly intended that the fee should cover reporting, clearance, fittage on bunkers, and all services. It is expected that in view of the unusually high fee on such vessels, brokers will be willing to purchase any necessary bunkers, charging them to managers at cost price. It is further to be noted that this fee is not payable to merchants who, having chartered the steamers, may act as brokers, but only to brokers appointed independently by the managers. The fee is furthermore only applicable to foreign-going steamers, and does not apply to any home trade (coastwise) vessels.

BELFAST DISTRICT.

(FROM OUR OWN CORRESPONDENT.)

Increased Rates.—Notice has been given that from June 1, through rates for merchandise between the principal Irish stations and the ports on the West Coast of Scotland and stations on the Scottish Railways will be increased as follows:—Rates not exceeding 20s. 5d. per ton, increased 2s. 1d. per ton; exceeding 20s. 5d. per ton, but not exceeding 33s. 4d. per ton, 4s. 2d. per ton; and exceeding 33s. 4d. per ton, 6s. 3d. per ton.

Riveting Records.—Two riveting records were broken in the Belfast yards last week. On Tuesday, John Lowry, who has been 32 years with Harland & Wolff, set out to establish a world's record, and succeeded in driving 7,841 rivets in nine hours, the previous best being the record of 6,783, made at Clydebank. Working on the tank floor of a standard ship, Lowry used $\frac{7}{8}$-in. rivets, $2\frac{1}{4}$ and $2\frac{3}{4}$ in. long—the largest yet employed in these contests. Two and a quarter tons of rivets were used. Lowry began at 6.20 a.m., and had the usual intervals for meals. The Lord Mayor of the city was an interested spectator of part of the performance, as was also Mr. Chas. Payne, J.P., one of the directors of the firm. In the last hour of the day, Lowry drove 931 rivets—in itself a record. The hour record was broken on the following day at Workman Clark's, when John Moir established a world's record by driving 1,115 $\frac{7}{8}$-in. rivets in one hour. He was also working on the floor of a standard ship, but had the advantage of being fresh, whereas Lowry's hour record was made in the last sixty minutes of the day. One of Workman Clark's men will probably make an attempt on Lowry's day record shortly.

Important Legal Case.—Mr. Justice Pim, chairman of the Munitions Appeal Court, Ireland, was engaged for three days last week on the hearing of the appeals brought by Harland & Wolff from a decision of the Belfast Tribunal, in which it was held that certain platers' helpers were entitled to a week's notice. There were 1,022 cases concerned, involving between £4,000 and £5,000 in wages. The facts were that the platers were on strike in connection with the bonus question. In December, 1917, on the occasion of the first strike, the firm found employment for as many of the helpers as possible at other work. On the occasion of the second strike of platers, it was impossible to find work for the helpers, who then claimed a week's wages in lieu of notice, and this was given them by the Munitions Court. It was admitted that prior to the war the helpers never made a claim for disemployment by reason of the absence of the platers; but it was contended that war and the manufacture of munitions had altered the conditions of their employment, and that they were now entitled to continuous work, whether the platers were in or not. At the close of the arguments on June 1, the Judge reserved judgment. A similar point is involved in appeals brought by the North of Ireland Shipbuilding Company, Londonderry, in connection with smiths' helpers.

THE FREIGHT MARKETS.

(FROM OUR OWN CORRESPONDENTS.)

London.—Business on the Baltic Exchange remains quiet, though freight rates are maintained at high values. Homeward from the River Plate, 225s. is the figure ruling to the United Kingdom, and 250s. to France. From the ports of the South American Atlantic seaboard, 220s. is obtainable to the United Kingdom, 240s. to France, and 360s. to Italy. For Gulf loading an additional 30s. can be had. The demand is chiefly for tonnage for heavy grain from the Northern Range, and for this class of business 50s. is offered to the United Kingdom, 57s. 6d. to France, 75s. to the French Mediterranean and 77s. 6d. to Italy. Coal cargoes from Virginia to the Plate can be worked at 80s. There is no abatement in the demand for tonnage from the East. Karachi indicates 250s. on scale basis to this country; Bombay, on deadweight, would pay 275s. to the same destination or 400s. to the Mediterranean and the Madras Coast, 550s. to Marseilles for kernels. The rice ports of Saigon and Burmah offer 500s. to this country or France. The Mediterranean ore and phosphate ports are absorbing tonnage on the basis of 45s. Huelva to the Mersey, 60s. Huelva to the East Coast United Kingdom for pyrites, 50s. Bougie to the Clyde and 65s. Tunis to the same destination, 70s. Sfax to the Bristol Channel and 50 frs. Bilbao to Boulogne. In the Bay trade fixtures have been made at 20s. Bayonne and 17s. Bordeaux to Bristol Channel.

Glasgow.—Business on the Glasgow market was again disappointing throughout the week. The reduction in the output of the collieries and the consequent scarcity of coal for export has to a considerable extent affected that particular trade from Scottish ports. While the market has continued quiet, however, rates have been very firm. The following fixtures were reported:—Swansea to Trouville (neutral), 300, limitation rate; Caen (neutral), 1,450, 46s. 6d.; Caen (neutral), 1,950, 46s. 6d.; Tyne or Blyth to Gothenburg, 2,500, 180s.; Bordeaux to Bristol Channel, 17s. prompt; Buenos Ayres to New York, 208s. 6d., cubic metres; Norfolk to Havana, about 40s., coal; and ship chartered, Buenos Ayres to New York, 85s. 6d., linseed, May-June.

Newcastle-upon-Tyne.—There appears to be no limit to the growth in the strength of the Newcastle coal market at present. Orders for fuel for neutral consumption are pressing on the market, and prices of supplies for such customers have advanced sensationally. Collieries, are, however, fully employed in the attempt to keep pace with the ever-growing demand for fuel on Government, Allied and home accounts, and neutrals are having to be fobbed off with small lots available to them rarely, and in quite unsatisfactory quantities. The arrivals of requisitioned tonnage for the loading of official cargoes leave nothing to be desired from the collieries' point of view, save that they are, if anything, just too good at present. There is a little more diversity in the list of fixtures this week. As has been the case for some time past, Sweden monopolises most of the business, but a small steamer has been taken up for Dieppe, option Honfleur or Caen, at 72s. 3d. for coke. Quite a tiny craft has been chartered for London at 17s., plus 10 per cent., and a 6,400-tonner has been taken up for Port Said at the now well-established rate of 200s. As to Sweden, Gefle has been done at 205 kr., which indicates some hardness on the week; Gothenburg, at from 180 kr. to 185 kr., which is 5 kr. up, and Stockholm, three times at 205 kr. and once at 207½ kr., very high rates; the increases are due to the comparative shortage of Swedish tonnage and the present difficulty in securing early loading turns. For all other directions there is no neutral shipping on offer and business is nil. The rates quoted a fortnight ago have undergone no change.

Liverpool.—Freights on this market continue their all-round firmness, though business continues to be restricted to the tonnage

that is available for Allied and neutral discharges. There is a particularly good enquiry for time boats, and up to 58s. is offering for suitable neutral vessels, but generally 46s. 6d. is the basis in the general trades for twelve months. The States-West Indies trade maintains the 35s. rate for round trips. No particular change is to be noted in homeward freights, except it be that River Plate has developed firmness, though very little, outside Government business, is yet done. The basis is still around 225s. from Buenos Ayres to United Kingdom, and linseed paid 85s. 6d. to New York. North America continues firm with a good inquiry for net charters, which from the Northern Range are based on 220s. to 230s. to Liverpool, while 240s. is quoted to France, 360s. to West Italy, and 390s. from the Gulf of Mexico to Genoa. Grain rates are firm at the Range Ports, and 50s. is quoted to United Kingdom, 57s. 6d. to North France, 75s. to Marseilles, and 77s. 6d. to Italy. Eastern markets are still without free tonnage and offer 550s. from Madras to Marseilles, 500s. from the rice ports to this country. Karachi repeats 250s. scale basis, and Bombay would take 400s. to Genoa. Aden has fixed several boats with salt to Calcutta at 26½ rupees, June.

Cardiff and Swansea.—Extremely quiet conditions have prevailed on the outward coal freight market. This is entirely attributable to the extreme scarcity of coal. The output of the coal-field during the past week has been curtailed owing to the attitude of the miners in certain parts of the district, but now that work has again been resumed in the Eastern and Western valleys of Monmouthshire, outputs should soon return to their normal state. Tonnage supplies continue plentiful for the purposes of the authorities, and business has been mainly confined to the limitation ports. The fixtures disclosed were:—St. Malo, 21s. (Allied); Caen, 48s. (neutral); Bordeaux, 69s. (neutral). A small sailing vessel was taken at 140s. for Montagne. On the Swansea market the position remains unchanged. Orders are plentiful, but business is governed by the tonnage position. Rates for all directions are maintained at their previous levels. The only transactions reported were:—Caen, 46s. 6d. (neutral); Rouen, 48s. 9d. (neutral).

Hull.—The market has a firm tone and tonnage is very scarce. In the North French market business shows the most activity, and there is a keen demand for fuel and tonnage for all the North French ports. There is a difficulty also of obtaining fuel, but the supply is more regular now that the effect of the stoppage at Whitsuntide has been recovered from. The West Italian market is firm with a fairly good demand, but tonnage is hard to secure for this trade. Neutralwise, the market is almost lifeless.

AUSTRALIA WANTS SHIPS.

The Hon. J. D. Connolly, Agent-General for Western Australia, in London, thinks that Australia will be one of the first countries in the world to recover from the effects of the war. In discussing post-war problems recently, he said: "Everything depends upon ships, and we must join in a gigantic Australian effort to produce locally all that the States of the Commonwealth need. We have all the raw material necessary and most of it in practically unlimited quantities, and right alongside protected waters eminently suited to the construction of shipbuilding yards. The skilled labour is already in Australia, or can easily be attracted there by the universally high standard of wages and working conditions. The success of nearly all our great industries is bound up with this question of securing tonnage, and certainly the development of a vigorous immigration policy depends entirely upon our capacity to provide shipping berths. With India, the Far East and America, our opportunities for trading simply have no limitations, while, of course, the whole of the European markets are always ready and anxious to take wool, wheat, timber, fruit, metals, and other products. That Australia can build ships has already been proved, and nothing remains now but to go full steam ahead, exploiting to the utmost limit her resources of raw material, of organising genius, and of skilled labour, in order to make the shipbuilding programme a real factor in the reconstruction of the Empire."

TRANS-OCEANIC TRADING COMPANY, BERGEN.—A new Norwegian company has been established under this title, with a capital of £276,000. Branches are to be opened in New York, Port au Prince, Haiti and Rio de Janeiro. Several small Norwegian oversea firms are to be merged in this concern which will operate its own lines of vessels (probably chartered) for oversea trading, and will also establish coastal services in Haiti and Brazil.

QUESTIONS IN PARLIAMENT.

Shipping Losses.

Mr. France, on May 30, asked the Secretary to the Admiralty how many ships of 1,600 tons or over on the British Register had been lost by enemy action and marine risk during the four weeks ending Saturday, May 25.

Dr. Macnamara: By a recent decision of the War Cabinet, after very full consideration, and in agreement with our Allies, mercantile losses are now published monthly in the form of tonnage figures. It is not proposed to supplement this information by publishing also the number of vessels lost in any month or other period.

Mr. Alden asked whether the recent reduction of shipping losses published for last month indicated a more successful resistance to attacks by submarines or were the result of fewer attacks by submarines due to withdrawal for refitting by the German Admiralty; whether ship production had yet begun to balance ship destruction; and, if not, when he anticipated that we should begin to wipe off arrears of shipbuilding.

Dr. Macnamara: Until final figures of world output for April, May, and June are available it is not considered desirable to make any more definite statement than that of the Prime Minister in his speech of May 24 at Edinburgh, to the effect that the Allies as a whole are building merchant ships faster than the Germans can sink them. The reduction in losses is of course not due to any one cause, but to a combination of all factors, offensive and defensive.

Liner and Tramp Rates.

Sir Walter Runciman, on May 30, asked the Parliamentary Secretary to the Shipping Controller, what were the reasons which induced him to agree in the liner requisition agreement to hire for liners being paid during periods of inefficiency due to marine risk contributed to or prolonged by war conditions; whether, moreover, the rates of hire for liners were higher than for what were called tramps; whether in a very large number of cases modern tramps were more expensive and higher-class vessels than many vessels called liners; and for what reason he had placed the tramps in respect to these two hire conditions in a worse position than liners.

Sir L. C. Money: The arrangements referred to in the first part of the question was agreed to as part of a comprehensive bargain with the liner companies. As regards the remainder of the question, the rates of hire for tramp vessels under requisition have recently been increased, and in arriving at the new rates the contingencies referred to by the right hon. member have been fully taken into account. As a result the rates for tramps are now, in some cases, above those for cargo liners of similar size and speed.

Admiralty Tugs and Salvage.

Mr. Snowden, on June 3, asked the Secretary to the Admiralty, whether the tug-boat men on Admiralty boats who rescued torpedoed ships received any special remuneration or recognition; whether the men of the chartered tugs received salvage or prize money; and whether the Admiralty would consider the desirability of treating the men in the service of the Navy in the same way as the men employed on chartered tugs.

Dr. Macnamara: When tugs are chartered on conditions not amounting to a demise to the Crown, salvage claims can be made by the owners and crews on their own authority, Admiralty consent not being necessary. When Admiralty owned tugs and tugs chartered on conditions constituting a demise to the Crown perform salvage services, the Admiralty may make a claim in respect of, or give their consent to, a claim being made by the crews. If the vessel salved were a vessel under Government requisition, salvage would not be allowed if the Government took both war risks and marine risks. If the damage were from marine risks and not covered by the Government, then a salvage claim would be allowed. But where the crew is not allowed to make a claim for salvage and the services are exceptionally meritorious the practice is to consider the crew for a special grant from Navy rates.

Aliens and Pilotage Licences.

Colonel Burn, on May 30, asked the Parliamentary Secretary to the Board of Trade whether he was prepared to introduce legislation at the earliest possible moment to prohibit the use of pilotage licences for home waters to all aliens and to confine the same strictly to British subjects.

Mr. Wardle: At the present time no alien holds a pilot's licence for any port in the United Kingdom, and so far as I am aware such licences have never been granted to aliens. A pilotage certificate may be granted to the master or mate of a ship under certain con-

ditions enabling him to dispense with the services of a licensed pilot in a specified district. Such certificates can only be issued to British subjects except in certain special cases for which provision is made by Section 24 of the Pilotage Act, 1913. All such certificates held by enemy aliens before the war have lapsed, and no provision exists for their renewal. As regards other aliens, provision is made for the renewal of certificates which were in force before June 1, 1906. No new certificates can be granted to aliens in any district if the Admiralty at any time consider that on the grounds of public safety this should not be done. In these circumstances, as at present advised, the President of the Board of Trade does not consider that any further legislation is necessary.

Steel for Shipyards.

Mr. J. Mason, on May 29, asked the Secretary to the Admiralty whether he was aware that the premises of steel workers were becoming blocked with plates for shipping which the railways were unable to accept for carriage because the shipyards were not ready to receive them; whether, under these circumstances, he proposed to urge the steel works to increase their rolling power; and whether such works might be allowed temporarily to manufacture other forms of steel which could be delivered and steel for export for munitions to France.

Dr. Macnamara: Whilst it is true that some time ago there was difficulty on the North-East Coast of England in obtaining conveyance from the steel works to the shipyards of certain quantities of plates for shipbuilding, the situation has now materially improved. The difficulty of obtaining carriage was largely due to lack of wagons, although in certain cases also to lack of means in the shipyards to unload wagons already delivered. It is still necessary that the rolling power of the steel works should be increased wherever possible, looking both to our present and future needs. In reference to the last part of the question, it is understood that all the most urgent uses for steel are always kept fully in view by the Steel Allocation Committee in deciding upon the forms of steel which the steel firms should manufacture.

Engineers for National Shipyards.

Colonel Sir J. Norton Griffiths, on May 30, asked the Secretary to the Admiralty whether he would state the number of special commissions which had been given to men of military age for the purpose of training as shipyard engineers for the national shipyards; whether he was aware that there were a large number of discharged officers, non-commissioned officers, and men who had high technical qualifications and who could fill such vacancies; and whether he could undertake that preference would be given to such officers, non-commissioned officers, and men, so that all medically fit men of military age might be free for active service with His Majesty's Forces.

Dr. Macnamara: No special commissions such as those referred to by my hon. and gallant friend have so far been granted. Special commissions for this purpose will not be granted until the men have passed a probationary period and are ready for drafting to the national yards. Up to date 20 such probationers have reported, and out of this number six only are officers, the remainder being civilians. None of the officers are fit for general service, and preference is always given to officers at present unfit for general service, discharged officers, non-commissioned officers and men. The suggestion contained in my hon. friend's question has, as he will observe, not been, and will not be, lost sight of.

American Ship Construction.

Mr. Alden asked the Parliamentary Secretary to the Shipping Controller whether it was possible to state the rate at which America was now able to turn out vessels for mercantile purposes built either of steel, wood or concrete; and whether any figures were available as to the loss of American ships already constructed.

Sir L. C. Money: I am not able to answer this question with any degree of precision, and I can only refer my hon. friend to the details which have been given in the Press. Rate of output cannot be ascertained in a rapidly expanding industry by reference to recently published figures. As to American losses, I shall be glad if my hon. friend will consult the Admiralty.

Women Passengers at Sea.

Colonel Wedgwood, on June 3, asked the Secretary to the Admiralty, whether his attention had been drawn to the fact that women wishing to go to America with the intention of getting married were refused passports, while the wives of Canadian officers were urged to return to Canada; and, if so, would he state what reasons guided his office in this policy.

Dr. Macnamara: I am answering this question on behalf of the various Departments concerned. The general policy is that travelling of women and children by sea is to be restricted to the utmost possible extent, and not to be allowed except in cases of the greatest possible urgency, in which refusal to grant passports would involve great hardship. It is the fact that the Canadian authorities issued a notice to wives and dependents of Canadian officers and other ranks not intending permanently to reside in this country to consider the question of return to Canada. That has led to a number of requests for repatriation and endeavour has been made to meet them. But the case of a woman who desires to go to America or any other part of the world to get married appears to be on a different footing and is viewed along the lines of the general statement I made at the outset. These requests, as I have said, are only granted in the rare case in which refusal would involve real hardship. In such a case the request is referred to the Inter-Departmental Passport Committee to advise the Secretary of State for Foreign Affairs as to whether or not a passport should be issued.

Mr. Pringle (Lanarkshire, N.W., Liberal): Is it not a real hardship not to allow a lady to get married when she wants to?

Dr. Macnamara: We are anxious that women should not go to sea. It is bad enough when men are in a torpedoed ship. It is worse when there are women and children.

Mr. Holt: Is there no other reason?

Dr. Macnamara: There is no other reason.

Sir F. Flannery: Is it not the case that the presence of women on board renders things much more difficult when a vessel is torpedoed?

Dr. Macnamara: That is what I have endeavoured to point out, but a case of real hardship is referred to the Inter-Departmental Committee.

Concrete Ship Construction.

Answering Mr. P. A. Harris, who on June 3 asked a question relating to the construction of concrete vessels in Italy, Dr. Macnamara said: It is a fact that sea-going concrete barges of 150 tons capacity were constructed in Italy some 10 years ago. I have no information, however, regarding the development of the construction of reinforced concrete craft in Italy, and so far as I am aware only a very small number is in use. We are of course glad of information at all times and from all sources. In recent years this industry has been widely developed in Scandinavia, and full reports as to the methods of construction in that country have been obtained.

Mr. P. A. Harris also asked whether the large reinforced concrete ships recently launched or on the stocks on the Pacific coast of America had been inspected by any British engineer or shipbuilders; whether any independent report on their design and construction had been obtained; and whether such reports could be circulated for the benefit of the British industries interested, so that the lessons learned might be applied in our shipyards without an undue time having to elapse in experimental construction of smaller tonnage.

Dr. Macnamara: The large concrete ships recently launched in America had been inspected by a British engineer and his report is in the possession of the department concerned, which also possesses independent reports on these ships, while further reports are now awaited. When the information obtained—which would, of course, include a sea-going test—is comprehensive enough for the purpose, a report can be drawn up for the benefit of the British industries interested.

Soldiers Withdrawn for Shipyards.

Mr. Alden, on June 3, asked the Under Secretary of State for War, whether he could state the number of men already released from the Army for shipbuilding purposes; and whether he proposed to release the necessary men for all the shipyards of the country engaged in the production of merchant shipping.

Mr. Macpherson: Nearly 10,000 men have been released from the Army for this purpose. As my hon. friend is no doubt aware, the War Cabinet decided that men should be released from the Army for shipbuilding, and I am afraid that I cannot answer the last part of the question.

American Tonnage Figures.

Sir A. Williamson, on June 4, asked the Secretary to the Admiralty whether the figures published monthly by the Admiralty of shipping losses were those of the net registered tonnage lost; and whether, seeing that in the statements as to the amount of tonnage being built in the United States the figures of deadweight tonnage were generally used and it took 2 deadweight tons to equal 1 ton net

...ter, he would take steps to prevent a comparison being mis-...ing.

Dr. Macnamara: The figures published by the Admiralty of shipping losses and tonnage built whether in the United Kingdom, the United States of America, or elsewhere, are gross registered tons and not net registered tons. This is clearly shown in the heading of each published statement. Every effort has been made to avoid misleading comparisons between American and British capital.

Sir A. Williamson asked whether it was not a fact that the published statement of the United States showed gross deadweight tonnage and not gross registered tonnage.

Dr. Macnamara agreed that that was so.

Military Dockers at Dublin.

Mr. Anderson, on June 4, asked the Financial Secretary to the War Office whether, in respect of the loading and unloading of ships at the ports, it was the policy of the War Office that available civilian labour should be utilised before military labour was employed; if so, whether he could state why military labour was being used by the authorities at the North Wall, Dublin, to the detriment and unemployment of civilian labour; whether it was the intention of the military to send over to Dublin a further battalion of soldier dockers unless the workmen there were prepared to accept a wage less than the standard wage; and what action it was proposed to take in this matter.

Mr. Forster: I understand that the Ministry of Shipping is responsible for the loading and unloading of ships. I have explained before the necessity for the use of military labour in Dublin. I am not aware of any intention to send soldier dockers to Dublin from this country.

Soldier Labour in Shipyards.

Mr. Anderson, on June 4, asked the Parliamentary Secretary to the Ministry of Pensions whether, in the case of a soldier temporarily lent from the Army to work in shipyards, who lost his life by drowning whilst at work, his widow and children are entitled to a pension; and, if so, to what amount.

Sir A. Griffith Boscawen: A soldier temporarily released for civil employment, provided he is not transferred to the Reserve for this purpose, and while following such employment, retains for himself, his family, and dependants all their rights and privileges in regard to pensions under the Royal Warrant as though he had continued to serve as a soldier. The employer is, however, liable to pay any compensation due under the terms of the Workmen's Compensation Act, the Employer's Liability Act or at Common Law. Where, therefore, the benefits due under the Royal Warrant are in excess of the compensation due from the employer, the Ministry of Pensions will make good the difference.

Interned Masters in Germany.

Mr. Cathcart Mason, on June 4, asked the Parliamentary Secretary to the Board of Trade whether his attention had been directed to the case of a master mariner imprisoned in Germany who was given to understand that the Government did not recognise the services of the mercantile marine; and if he could possibly make the position clear.

Mr. Wardle: The proposal made in the case referred to by the hon. member is in effect that the Government should pay in full the wages of all officers of the Mercantile Marine interned in Germany. At present allowances on a pension scale are paid to the dependants in this country, and the expense of special treatment in officer camps in Germany is guaranteed. I do not think that in these circumstances it can be fairly suggested that the services of the Mercantile Marine are not recognised by His Majesty's Government.

COMPANY MEETINGS.

City of Dublin Steam Packet Company.—The half-yearly meeting was held on May 14, at Dublin.

The chairman (Mr. Edward Watson) said the report set out the position of affairs in regard to the mail service. So far as the Irish Members of Parliament were concerned, they believed they had their full support. The position of affairs was that a memorial, most influentially signed by Irish Peers and Members of Parliament, was presented early last month to the Right Hon. H. E. Duke, K.C., M.P., Chief Secretary for Ireland. Mr. Duke replied that he was dealing with the matter. Since his reply was received, he had resigned the Chief Secretaryship, and the memorial, it was presumed, would be before the present Chief Secretary. Of course, they must shortly know what the Government intended to do. There were certainly no other ships in existence which were capable of carrying on the Holyhead and Kingstown service as it was carried on at present. They had never ceased urging on the Admiralty the necessity for protection of the mail packets against submarine attack, and they were also of opinion that the sailings should be in daylight. As to the company's cargo services, no change had taken place since the last meeting. The resolution passed by the proprietors was forwarded to the Shipping Controller on November 14, and was followed by a full report of the proceedings at the meeting, but beyond a bare acknowledgment no notice had been taken of it. He did not hesitate to say, from personal knowledge, that, if the impartial inquiry asked for, had been granted, the company's vessels and business would not have been managed in the inefficient, extravagant, capricious and inconsiderate way they had been from the time they were handed over to the London & North-Western traffic manager, to the end of the half-year. There appeared to be an idea that there was some resulting benefit to the public consequent on the change in the management, and if the gentleman who, amongst other positions, holds that of chairman of the Dublin Port and Docks Board, had been correctly reported by the *Freeman's Journal*, he had had the hardihood to assert that the company's vessels were being worked 100 per cent. better than they were before. Now, of course, from his position, the chairman had means of knowledge, and remarks from him might be considered of weight which they would not have coming from anybody else, and he had absolutely no justification for making them. Exact particulars taken out showed that, comparing the carryings and sailings of the company's vessels from the date in October last, when the vessels were requisitioned, up to the end of the half-year with similar particulars for the corresponding period ended February 28, 1917, under Government control, the vessels made 33 more passages, but carried nearly 5,000 tons less cargo than when the vessels were in the company's own charge. Owing, it was understood, to the orders of the Food Controller, reaction from which was now being experienced, the export of cattle from Ireland was much larger in the last season than in the previous one; naturally, the exports from every port, including Dublin, increased, and the vessels carried very considerably more; but, on the other hand, independent competitors to England carried considerably less, which seemed to demonstrate that the shipping resources of the port were not utilised as they might have been; and, moreover, the cost of working had been far greater, as 21 of the vessels were brought back empty, while in the corresponding period they did not sail any ships without cargo, and the cost of coal consumed by them was needlessly increased. Their vessels had always been coaled in Liverpool and not in Dublin; coal was much more expensive in the latter port than in the former, but, under Government control, principles of economy seem altogether lost sight of; while their contractors' price in Liverpool was 26s. per ton, in a period of a little over two months the vessels were supplied with 432 tons in Dublin at 42s. 6d. per ton. The Ministry of Shipping had asked them to furnish their claim on account of the loss of the *Cork*, and they, acting under advice, had done so. The *Belfast* had been taken under the Defence of the Realm Act. They declined to hand her over either to the London & North-Western traffic manager or to the British & Irish Company, and what subsequently happened showed they were right. For some reason, not very apparent, the Ministry of Shipping wished to make it appear that it was the British & Irish Company, and not the London & North-Western traffic manager, the Director of Cross-Channel Transportation, who was managing matters in Dublin. That gentleman was acting in just the same way now that he was doing six months ago. The London & North-Western Railway Company were strong cargo and cattle traffic competitors, but so far as the mail service was concerned they were allies, and they were on very friendly terms with them. The London & North-Western never attempted to run an opposition line between Dublin and Liverpool, which is what the British & Irish Company, or, more properly, "Coast Lines, Ltd.," was doing. Mr. Read is the manager or the managing owner of the British & Irish Company. The Coast Lines and the British & Irish Company were virtually one and the same, and that if it were the case that that concern were managing their vessels it would be a most indefensible arrangement, Mr. Read being, moreover, Director of Home Trade Services and the Controller of Cross-Channel Traffic. In arranging to pay off the mortgage loan they thought the fairest way was to take the names in alphabetical order, and to make up the amount gave notice to 60 holders; of these, 14 had written to be paid off on June 1.

After several shareholders had expressed their complete accord with the chairman's remarks, and the formal business of the meeting had been transacted. the proceedings terminated.

COMPANY REPORTS AND DIVIDENDS.

Field Line (Cardiff), Ltd.—The directors have announced an interim dividend of 2½ per cent.

Manchester Dry Docks Company, Ltd.—An interim dividend is declared of 10s. per share, free of tax.

Bremer Schleppschiffahrtsgesell.—The directors recommend a dividend of 12 per cent. (compared with 10 per cent. last year).

H. G. Blair & Co., Ltd., Cardiff.—This firm of nautical opticians has declared an interim dividend of 15 per cent. per annum, free of income tax.

Union Steamship Company of New Zealand, Ltd.—8 per cent. per annum (9⅝d. per share), less tax, on ordinary shares for half-year (interim). Last year the dividend was the same.

Houlder Line, Ltd.—A final dividend is declared of 5 per cent. (2s. 6d. per share), free of tax, on ordinary shares, payable June 7, making 20 per cent. for year; £10,000 to insurance fund, making £30,000; £33,750 to depreciation account; and £21,609 carried forward. Last year, 20 per cent. was paid.

British & African Steam Navigation Company, Ltd.—It is announced that the debentures having all been redeemed and cancelled, the usual issue of a balance sheet is discontinued. The directors report, however, that the profit for last year amounted to £118,088, out of which a dividend of 6 per cent. has been paid, and £30,000 placed to reserve. The amount carried forward is £60,373, against £32,285 brought in.

Aberdeen Steam Trawling & Fishing Co., Ltd.—The profit for the year to April 30 was £29,074, against £29,001 the preceding year. The Board write off for depreciation on vessels, buildings, machinery and plant £13,500, against £12,000; and £5,000 is put to general reserve, against £2,000. A dividend of 20 per cent. is declared, free of tax, the same as previous year; and the carry forward is £7,321, against £7,422.

Nederland Company, Amsterdam.—Notwithstanding a heavy decrease in traffic between Holland and the Dutch East Indies, the revenue for 1917 exceeded that for 1916, thanks to the increased traffic between Java and the United States of America. The accounts show:—Steamship profits, £1,900,000 in 1917 (compared with £1,500,000 in 1916); depreciation on vessels, £539,000 (£393,000); reserve for new constructions, £309,000 (£317,000); war profit tax, £500,000 (£417,000); dividend, 20 per cent. (15 per cent.), £445,000 (£323,000); book value of fleet, £1,930,000 (£2,190,000).

Elder Dempster & Co., Ltd.—The report for the year ended December 31, 1917, states that the profits for the year amount to £366,901, and after adding £74,679 brought forward, and deducting the interest on debentures and dividends on the preference shares, there remains £287,630. An interim dividend of 4 per cent. has been paid on the ordinary shares, leaving a balance of £239,630, which is to be dealt with as follows:—To general reserve, £50,000; special donation to Elder Dempster Superannuation Fund Association, £10,000; final dividend of 6 per cent. on ordinary shares (making 10 per cent. for year) and dividend on management shares, £96,000; leaving to carry forward £83,630. The directors report that in April, 1917, the company's fleets were requisitioned, since when the steamers have been run for Government account.

Oldenburg Portugiesische Dampfschiffs Rhederei, Hamburg.—A dividend of 15 per cent. has been declared for 1917 (compared with no dividend for 1914, 1915, and 1916). Including a balance of £1,100 brought forward, the gross profit amounted to £73,800 (£32,300 in 1916), against which there were expenses, £13,800 (£12,200), interest and discount £3,250 (£15,400), taxes £1,300 (£1,050), insurance £1,530 (£2,390), guarantees £5,000 (nil), war profit reserve £5,400 (nil), and insurance premium reserve £8,450 (nil). The net profit was £35,300. The nine steamships remaining at the disposal of the company were engaged from the spring to the autumn, except one which was damaged so severely as to contribute little to the revenue. The other eight vessels realised good profits, but only by the company undertaking part of the war risk. The value of three vessels sold during the previous year, and of vessels lost by war causes, has been deducted from the steamship capital account. Johann Welker has been elected to the board in place of E. Piper (retired). Every effort is to be made to order new vessels in the place of those lost.

Turbinia A.G., Berlin.—A dividend of 8 per cent. on the preference shares and of 20 per cent. on the original shares is paid for 1917-18; equal dividends were paid last year. The company was occupied "yet more busily than last year," and its investments again yielded satisfactory results. The company took up the number of shares to which it was entitled in the new issue of the Howaldtswerke. The net profit was £14,900 (£14,800 last year), distributed as follows:—Dividend, 8 per cent. and 20 per cent., £11,800 (unaltered); directors, £735 (£735); carried forward, £2,440 (£2,380); shares and bonds, &c., £192,500 (£144,500); orders in hand, £217,000 (£103,500); bank and cash, £212,000 (£19,200); debtors, £27,400 (£28,250); original share capital, £49,000; preference shares, £98,000 (£73,500 not paid up); statutory reserves, £7,350 (£7,350); payments on account, £410,000 (£101,000); creditors and special reserves, £143,000 (£99,000); net profit, £14,900 (£14,800).

Newport Abercarn Black Vein Steam Coal Company, Ltd.—The report for the year ended March 31, 1918, states that the net profit, after deduction of debenture interest, was £36,771, which, with balance from last year, £49,594, makes a total of £86,365. From this must be deducted interim dividends on pre-preference and preference shares £5,437, leaving available £80,928, which the directors recommend dealing with as follows:—Dividend of 3¾ per cent. on pre-preference shares (less income tax), making with interim dividend paid, 7½ per cent. for year, absorbing £2,812; dividend of 3½ per cent. on preference shares (less income tax), making with interim dividend paid, 7 per cent. for year, £2,625; dividend of 20 per cent. on ordinary shares (free of income tax), £15,000, leaving to carry forward £60,490. Provision has been made for excess profits duty, but no allowance has been made for any payment that may have to be made under the Coal Mines Control Agreement (Confirmation) Act, 1918, there being certain matters not yet settled. Payments amounting to £3,371 have been made during the year to dependants of men who are serving in the Forces.

COMPANY REGISTRATIONS.

Clyde Cold Storage Company, Ltd.—Capital, £100,000, in £1 shares. Objects: To carry on the business of storekeepers, warehousemen, ice manufacturers, merchants, shipowners, carriers, &c. Signatories:—

R. Hamilton, Mossgill, Lismahgow, clerk.
A. Cullen Pollok, Portland Park, Hamilton, clerk.
H. Birchin, 34, West George Street, Glasgow, chartered accountant.
J. Borland, 75, Harriet Street, Pollokshaws, Glasgow, clerk.
Hilda R. Gardiner, 12, Dalhousie Street, Glasgow, typist.
R. Montgomery, 14, Melville Street, Pollokshields, apprentice.
D. Macbride, 34, Marlborough Road, Cathcart, engineer.

The first directors are J. Cullen Pollok and David Mullen. Registered office: 10, Commerce Street, Glasgow.

Marston Line, Ltd.—Capital, £40,000, in £1 shares. Objects: To enter into two agreements with E. C. Marston & Co., Ltd., relating to (*a*) the purchase of the steamship *Wirral*, and (*b*) management, and to carry on the business of shipowners, shipbuilders, &c. Power is specifically taken to include in the business the acquisition, building, maintenance, and repair and disposal of aircraft. Signatories:—

J. J. Rammell, Arnold House, Wilmslow, merchant.
W. Watson, Greenbooth House, Norder, near Rochdale, wholesale grocer.
T. W. Robinson, "Chundalee," Bramhall Lane, Stockport, manufacturer.
G. H. Ward, 13, Norwood Avenue, Southport, wholesale and retail grocer.
T. B. Chapman, Allendale, Belmont Road, Hale, Cheshire, canned goods business manager.
A. Redman, 32, Victoria Road, Whalley Range, Manchester, director of grocery company.
J. W. Paton, 59, Whitworth Street, Manchester, shipper.
J. V. Marchanton, 8, Rawlinson Road, Southport, dyer.

The first directors are to be appointed by the subscribers. Secretary, H. J. Davidson, 33, Brazenose Street, Manchester. Private company.

Insurance Managers, Ltd.—Capital, £5,000, in £1 shares. Objects: Mortgage and insurance brokers, underwriters, financiers, &c. (except any businesses mentioned in Section 1 of the Assurance Companies Act, 1909). Signatories:—

S. S. McNicol, 6, Birchin Lane, E.C., underwriter.
T. F. Bickford, 10, Moorgate Street, E.C., underwriter.

The first director is S. S. McNicol. Registered office: 6, Birchin Lane, E.C. Private company.

Newport (Mon.) Shipyard, Ltd. Capital, £500,000, in £1 shares (250,000 preference). Objects: Builders, owners, repairers and salvors of and dealers in ships, tugs, barges, dredgers and vessels, &c. Signatories:

J. V. Rennie, 1, Elvaston Place, Queen's Gate, S.W.
C. H. C. Meier, 6, Crosby Square, E.C., Lloyd's underwriter and shipowner.

The first directors are to be appointed by the subscribers. Qualification, £1,000. Registered office, 21, Ironmonger Lane, E.C. Private company.

Rapid Submersible Ship Cleaner, Ltd. Capital, £250,000, in £1 shares. Objects: To carry on the business of ship cleaning in all its branches and to purchase or manufacture machinery and appliances for ship cleaning or the cleaning of hulls of ships, &c. Signatories:—

W. F. H. Secrô, K.C.M.G., 26, Chester Terrace, Regent's Park, chairman of Submarine Motor Ship Cleaner Syndicate, Ltd.
H. E. Fletcher, A.I.N.A., 54, Broad Street, E.C., naval architect.
T. P. Hardwicke, 5, St. Michael's Alley, E.C., insurance broker.
N. R. [illegible], 58, Gracechurch Street, E.C., member of Lloyd's.
W. J. Hoe, 66, Broad Street Avenue, E.C., consulting engineer.
F. J. Clerke, 3, Lloyd's Avenue, E.C., shipping broker.
G. Rutherford, 66, Broad Street, E.C., electrical engineer.

Minimum cash subscription, 7 shares. The first directors are to be appointed by the subscribers. Solicitors, Ashurst Morris, Crisp & Co., 17, Throgmorton Avenue, E.C.

Porthwen Steamship & Trading Company, Ltd.—Capital, £2,000, in £1 shares. Objects: Shipowners, ship and insurance brokers, managers of shipping property, carriers, traders, &c. Signatories:—

B. Evans, 80, Bishopsgate, E.C.2, shipbroker.
W. T. Potts, 81, Queen Street, E.C., company director.

The first directors are W. T. Potts and B. Evans. Registered office, 80, Bishopsgate, E.C. Private company.

NEW MERCHANT SHIP CONSTRUCTION IN THE UNITED KINGDOM.

RECORD OUTPUT.

The Secretary of the Admiralty has issued the following announcement with regard to the tonnage of merchant vessels completed in United Kingdom yards and entered for service during the month of May, 1918, compared with preceding periods:—

Completions for [illegible] months ending 1917.	Gross tons.	Completions for 12 months ending 1917.	Gross tons.
March 31	69,774	May 31	773,116
June 30	109,847	June 30	82,251
July 31	85,735	July 31	865,147
August 31	102,060	August 31	928,470
September 30	63,150	September 30	957,185
October 31	148,279	October 31	1,045,036
November 30	158,826	November 30	1,133,335
December 31	112,486	December 31	1,163,474
1918.		1918.	
January 31	58,568	January 31	1,173,953
February 28	100,038	February 28	1,194,540
March 31	161,674	March 31	1,237,515
April 30	111,553	April 30	1,279,337
May 31	197,274	May 31	1,406,838

The Controller-General of Merchant Shipbuilding makes the following comments:—

The satisfactory output for the month of May reflects great credit on the whole industry, and particularly on those firms engaged in the fitting out of vessels. The efforts made to reduce the period between the launching and completion of merchant ships, by closer co-ordination between shipbuilders and marine engineers, have produced satisfactory results, and the average time of fitting-out has been considerably reduced; in one instance during the month a 5,000-ton steamer was completed for service within 19 days of the launch.

This acceleration in the fitting-out has increased the output for May, but the public are again reminded that the output should be gauged over an extended period and not on the results of any one month, either good or bad.

A SHIPBUILDING RECORD. An Exchange message from San Francisco states that the world's record in shipbuilding has been reached in the case of a destroyer which will be launched 16 days and 10 hours after the keel was laid.

NEWS PARAGRAPHS.

Compania Navigazione Generale.—This company is absorbing the Lloyd Italiano and increasing its capital from £4,760,000 to £7,150,000.

Riveting Competitions. The directors of Cammell, Laird & Co., Ltd., announce that they are opposed to competitions in riveting or in any other form of industry in their shipyards.

Italian Salvage Company.—The Societa Italiana di Salvataggi e di Navigazione (Livorno) has been founded with a capital of £198,000 (£79,560 paid up) for the salvage of vessels sunk in Italian waters.

Australian Shipbuilding.—The Sydney correspondent of *The Times* states that the Australian Federal Government has placed a contract with a Sydney firm to build six auxiliary schooners of 2,700 tons within two years.

Rail Fares for Mercantile Marine.—All captains, officers, and other members of the crews of merchant ships on being discharged before the superintendent of a mercantile marine office may now obtain third-class tickets for either a single or return journey at the pre-war fares.

German and Austrian Capital Increases.—The following capital increases are announced:—Cuxhaven Hochseefischerei A.G., increase from £162,000 to £245,000. Reederei Oceania A.G., Trieste, increase from £417,000 to £500,000. Donau Dampfschiff. Gesell., increase from £2,520,000 to £3,150,000.

Khedivial Mail Steamship and Graving Dock Company, Ltd. With reference to this company's £150,000 first mortgage debenture bonds to bearer, it is notified that the principal moneys thereby secured will be paid to the bearers of such bonds on July 1 by Glyn, Mills, Currie & Co., 67, Lombard Street, E.C.3.

German Booty at Sebastopol.—In a telegram to R. C. Krogmann (president of the See Berufsgenossenschaft), the Kaiser states, *inter alia*, that 35 large transports, including one Rickmers and the *Rodosto*, fell into German hands at Sebastopol. It is hoped that brisk traffic will soon be established on the Black Sea by the aid of these vessels.

Officine Meccaniche e Navali di Napoli.—This concern has been founded in Naples with a capital of £357,060 and for the period up to 1970. It is proposed to build vessels and engines in Italy and abroad. The Credito Italiano has taken up £119,000 and the balance is in favour of the Societa Officine Meccaniche (formerly Miani, Silvestri e C.), with £158,000 in site and buildings and £80,000 in machinery.

Shipbuilding on the Malabar Coast.—The *Pioneer Mail* (India) states that at Beypore the construction is nearing completion of perhaps the largest wooden craft that has been turned out on the coast in recent years. It is being built for an Arab merchant at an estimated cost of Rs. 75,000. The vessel is mainly constructed of teak. It is provided with a deck, and has a carrying capacity of about 500 tons.

American Shipbuilding Contracts.—The Chicago *Economist* states that the latest contract of the United States Government with the American Shipbuilding Company amounts to $50,000,000, which is to be added to the $40,000,000 contract last year and to be completed by the latter part of the summer. The new contract calls for over 60 vessels of 3,500 tons carrying capacity. The two contracts, for about 130 vessels, mean an aggregate of 455,000 tons. Deliveries of vessels through the Welland Canal under the old contract have already begun. The new vessels are standard steamships of a class that are now operating in all parts of the world.

Transport "President Lincoln" Torpedoed.—A Reuter message from Washington states that Admiral Sims, commanding the United States naval forces in European waters, reports the torpedoing and sinking of the United States transport *President Lincoln*, which was on her return voyage to the United States. The vessel sank at 10 o'clock in the morning. No statement has yet been made in regard to casualties, if any. The *President Lincoln* was a vessel of 18,168 tons, built in 1907, by Harland & Wolff, Ltd., Belfast, and formerly belonged to the Hamburg-Amerika Line. She was among the ships seized by the United States Government on the outbreak of the war, and was quickly brought into service.

King George's Fund for Sailors. The General Council of King George's Fund for Sailors have received a donation of £6,000 from the colony of Hong Kong through the Hong Kong War Charities Committee.

Atlantic Passenger Rates.—Shipping agents throughout Scotland and England have been notified that passenger fares to and from the United States and Canada are increased by £12 on the minimum first-class rates in operation previous to the outbreak of war, £7 on second class, and £5 on third class.

Ships' Stores Restriction Order.—The Food Controller has given notice that the exemption from the provisions of the Ships' Stores Restriction Order, heretofore granted by him to home trade ships clearing for the voyage to and from Brest or any port in France and east of Brest, is withdrawn as from June 1, 1918, in so far as it relates to vessels propelled by steam or other mechanical power

British Minesweepers' Fund.—A German mine, secured by men engaged on mine-sweepers, has been unloaded and polished, and placed in the railway station at South Shields, as a receptacle for cash, books and papers for the British Minesweepers' Fund It bears the inscription: "Presented to the Borough of South Shields by the salvors," and has already attracted a lot of attention.

Mid-Scotland Ship Canal.—It is reported that the Cabinet has decided against the construction of a Mid-Scotland Ship Canal, as their advisers are said to be unable to accept as feasible any of the schemes submitted. The Cabinet considered both the heavy expenditure and the immense engineering difficulties. Glasgow Corporation are to confer with Edinburgh and other bodies to press the Government for a fresh survey of the direct route.

Torpedo Badge for Lascars.—The Secretary of the Asiatic Seamen's Institute, Birkenhead, has been informed by the Board of Trade that lascars will be eligible for the award of the new torpedo badge if they have served on the articles of any British merchant ship sunk or damaged by torpedo or mine, and if they have afterwards engaged for and completed a further voyage on the articles of a British ship. Application for a badge must be made personally at a mercantile marine office.

The "Faith's" First Voyage.—It is stated in *The Times* that Balfour, Williamson & Co., have received cable advices from San Francisco that the reinforced concrete steamer *Faith* has arrived at Seattle, State of Washington. The distance from San Francisco to Seattle is about 850 miles, of which about 700 miles are ocean sailing. The deadweight capacity of the *Faith* proves to be about 3,950 tons, probably including bunkers, and she draws 22 ft. 6 in. with a freeboard of 7 ft. 6 in. The cargo on the voyage to Seattle consisted of ore and salt, and it is expected that the vessel will return to San Francisco with a cargo of timber or coal, or both.

Canadian Shipbuilding.—The Toronto correspondent of *The Times* states that, according to Sir J. Flavelle, chairman of the Imperial Munitions Board, there is under construction in Canada one-quarter of the total merchant tonnage produced by the United Kingdom in 1917. Eighty per cent. will be completed this year. The construction of ships is only limited by the amount of money available and the fact that steel plates cannot be secured in Canada. Sir J. Flavelle states that the Board has spent £18,000,000, and placed orders aggregating £235,000,000. In view of this remarkable record, he thinks there should be less criticism and more commendation of the industrial war record of Canada.

America's New Standardised Ship.—A report from New York states that the zeal to expedite shipbuilding in the United States is illustrated by two launches under the auspices of the Emergency Fleet Corporation. At Port Newark, New Jersey, a new departure in steel ship construction took the water in the presence of Mr. Schwab, Mr. Edison, and other distinguished men. The vessel is made entirely of plates of shapes heretofore used in the construction of buildings and bridges. A hundred and fifty ships of this type have been ordered. As all the parts are standardised, it is expected that production at the rate of two or three ships weekly will be possible at this one yard. At Jacksonville, similarly, the first of a series of composite wood and steel ships was launched.

The Tatem Steam Navigation Company, Ltd.—It has been previously announced that a London firm of brokers were offering to purchase shares in this company at a price of £6 per £1 share, subject to the proviso that holders of 75,000 shares accepted this offer. It is now announced that the firm in question (Keith, MacAlister & Co.) have taken up all the shares offered them. But in connection with this announcement it must be borne in mind that Sir W. J. Tatem stated last week that he had no intention of severing his connection with the company or disposing of his interest in the concern. As far as can be gleaned in Cardiff shipping circles no fresh development has taken place so far.

"Wind Jammers" to carry Supplies.—The United States Government has decided to make increased use of sailing ships to carry supplies to Europe. In addition to the chartering of 400,000 tons of Norwegian sailing vessels, most of which are in American ports, the Government has completed arrangements for the placing of contracts for the building of 120 wooden ships of 4,700 tons each. These are to be constructed according to a new pattern, which is said to have exceptional merits. A vessel of this type, which has been called a "war marvel," was completed a few weeks ago, and several similar vessels are now being laid down.

British Engineering Standards Association.—The Engineering Standards Committee, which was formed in 1901 by the leading Engineering Institutions, has now become incorporated under the Companies Acts, 1908-1917, the word "Limited" being omitted by license of the Board of Trade. The Committee, therefore, becomes now a corporate body with a legal entity, and is thus enabled to maintain its position in regard to its brand, which has been largely used in a number of the British Standard Specifications. The wider use of the brand by manufacturers generally, who are working to the British standards, should be of material advantage to the British engineering industry throughout the world.

"Arethusa" and "Chichester." — The *Arethusa* and *Chichester* training ships are appealing on behalf of the work of their training ships and country homes for poor boys. The work is supported by voluntary contributions, and the society is much in need of help. Over 2,500 boys have been sent to the Royal Navy, and 6,500 have entered the Merchant Service. Others from their country homes have entered 120 regiments of the British Army, and in the fighting line on land and sea many are taking part in the present war. Altogether, 23,000 boys and girls have received training at the society's hands, and 95 per cent. of them are to-day bearing good characters. Subscriptions should be sent to 164, Shaftesbury Avenue, London, W.C. 2.

Deutsche Schiffspfandbrief Bank A.G., Berlin.—The capital of £490,000 (25 per cent. paid up) has been taken up as follows:—Dresdner Bank, £114,000; Berlin Handels Gesell., £114,000; National Bank fur Deutschland, £114,000; Allianz Versicherungs A.G., £24,500; Frankfurter Allgemeine Versicherungs A.G., £24,500; Deutsche Versicherungs Bank G.m.b.H., £98,000. The first supervising council comprises Dr. Gustav Hirte (chairman); Dr. Paul Bonders, Berlin; Paul Dumcke, Frankfort a.M.; Bankdirektor Kleemann, Berlin; Lusensky, Berlin; Generaldirektor of the Nahmer Berlin Syndikus, Dr. Sinterus. Loans may be made only in respect of vessels on the German register, and may not exceed six-tenths of the value of the ship or ship-share accepted as security.

Norwegian Concrete Motor Ship.—The first 1,000 tons d.w. concrete motor ship was launched at Jernbetonskibsbyggeriet's dockyard, Greaaker, near Fredriksstad, Norway, recently. The vessel has been designed for oversea trade, and is understood to be the largest concrete vessel so far built in Europe. She is classed "I.A.I. Betonlægter Experimental for carrying coal and timber" in the Norwegian Veritas. Her dimensions are as follows:—Length b.p. 170 ft. 3 in.; breadth (excluding fenders), 31 ft. 10 in.; depth, 18 ft. The carrying capacity is about 1,000 tons d.w. She has four watertight bulkheads, two holds, and two large hatches (26 ft. by 13 ft.). Accommodation for officers and crew are placed respectively in the poop and forecastle. The main machinery consists of two Bolinder motors of 160 h.p. each.

Medals for Shipyard Workers.—A New York correspondent of the *Daily Mail* states that for the purpose of bringing about a still keener spirit of rivalry in the American shipyards, the United States Shipping Board has created a competitive board charged with the task of awarding decorations and prizes for patriotic work. The scheme was planned by Mr. Charles M. Schwab, Director-General of the Emergency Fleet Corporation, who is convinced that men "work the best under the stimulus of praise and approval." The board will every month award distinctive flags to the shipyards which show the best returns, and medals will be awarded to meritorious employees. A war service badge worked in bronze will be given to workers in industries accepting the national war labour programme, and bars will be added to each badge for each four months of continuous faithful work.

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"SHIPBUILDING AND SHIPPING RECORD" TABLE OF SHIP SALES.

Name and Type.	Tonnage.	Dimensions. Draught in ( ).	Sold by, to	Builders, hull and year.	Machinery and builders.	Remarks.
Asama Maru, ss. (ex *Asama*) (renamed **La Chaussade**)	4,494 gr. 2,786 net	380′ × 45½′ × 29¼′ (25′ 1″)	Dairen Towa S.S. Co., Dairen, to buyers not stated	Palmer's Co., Ltd., Newcastle (1897)	24½, 41½, 70 × 45 (Palmer's Co., Ltd.)	Price about £350,000.
Blackburn, ss. (single dk.) (ex *Canto*)	967 gr. 575 net 1,330 d.w.	224′ × 30′ × 13′ (14′)	H. Keep, London, to Town Line, Cardiff	Strand Slipway Co., Sunderland (1900)	17½, 29, 47 × 33 (G. Clark, Sunderland)	Price about £40,000.
Daisai Maru, ss. (ex *Ulysses*)	3,681 gr. 2,282 net	354¾′ × 42¾′ × 26½′	Fukagawa Kisen Kabushiki Kaisha, Dairen, to buyers not stated	Scott & Co., Greenock (1892)	23, 38, 62 × 54 (Scott & Co.)	Price about £350,000.
Eggert Olafsson, ss. (trawler) (ex *Invicta*)	263 gr. 115 net	128½′ × 22′ × 11¾′	Akties. "Eggert Olafsson," Reykjavik, to buyers not stated	Cook, Welton & Gemmell, Beverley (1906)	12½, 22, 35 × 24 (C. D. Holmes & Co., Hull)	Price about £24,250.
Glenbridge, ss. (single dk.)	3,845 gr. 2,431 net 6,581 d.w.	350′ × 51′ × 23½′ (22′)	Glenbridge S.S. Co., Whitby, to buyers not stated	Irvine's S.B. & D.D. Co., W. Hartlepool (1911)	25, 40, 67 × 45 (Richardsons, Westgarth & Co., Hartlepool)	Price about £118,500.
Otto Trechmann, ss. (single dk.)	3,736 gr. 2,339 net 6,730 d.w.	370′ × 51½′ × 22½′ (21′ 9″)	Trechmann S.S. Co., W. Hartlepool, to Edmunds, Roberts & Co., Liverpool	W. Gray & Co., W. Hartlepool (1911)	25½, 40½, 67 × 45 (Central Mar. Eng. Wks., W. Hartlepool)	—
Soesterberg, ss. (single dk.) (re-named **Kristofa**)	482 gr. 265 net	157½′ × 25¾′ × 12¼′ (12′ 7″)	Mr. J. J. A. van Meel, Rotterdam, to Bowman & Co., Bergen	E. J. Smit & Zoon, Hoogezand (1917)	12 ⅜, 19½, 32⅝ × 17¹¹⁄₁₆ (E. J. Smit & Zoon)	Price about £14,000.
Széll Kálmán, ss.(spar dk.)	3,900 gr. 2,432 net 6,400 d.w.	366′ × 48½′ × 17¾′ (24′ 6″)	Royal Hungarian Sea Nav. Co., Adria, Ltd., Fiume, to buyers not stated	Wigham Richardson & Co., Newcastle (1902)	22½, 40, 66 × 48 (Wigham Richardson & Co.)	—
Toyo Maru, ss. (pt. awning dk.) (ex *Eastry*) (renamed **Besseggen**)	3,024 gr. 2,283 net	314′ × 40½′ × 21¼′ (22′ 6″)	Mr. S. Sawayama, Dairen, to Mr. Jens Folkman's Rederi Akties., Skien	Furness, Withy & Co., West Hartlepool (1892)	23, 37, 61 × 42 (T. Richardson & Sons, Hartlepool)	

Concrete Shipbuilding in Austria.—A petition has been carried to the Austrian Upper Chamber asking the Government to support ferro-concrete shipbuilding by all possible means, including, if necessary, the granting of financial assistance. It is asked also that the Government will encourage experimental work and do its best in the way of facilitating rapid deduction of definite conclusions from experimental work conducted in various countries.

Reinforced Concrete Shipbuilding in South Wales.—According to *The Times Engineering Supplement* a scheme is maturing for the re-establishment of the shipbuilding industry at Porthcawl. It is intended to build vessels of reinforced concrete, ranging from 80 ft. to 200 ft. in length, and having an average deadweight capacity of 1,000 tons and upwards. The promoters are a syndicate of Cardiff shipowners. It is proposed to lay down sufficient slipways to build four or five vessels simultaneously, and at the anticipated rate of progress it is contemplated that from 10 to 20 vessels, according to size, will be launched per annum.

Internationale Gewapendbeton Scheepsbouw Mij., Rotterdam.—Founded with a capital of £125,000, this is one of the largest ferro-concrete shipbuilding concerns yet established. One yard is already under construction near Rotterdam, and other yards are to be erected abroad. Amongst the well-known Rotterdam owners interested in the new concern are van Es, de Poorter and van Haas.

Speedy American Shipbuilding.—A Wireless Press message from Washington states that all records as to speed in ship construction have been broken by the New York Shipbuilding Corporation, which on May 4 launched a 5,500-ton freight steamer, the *Tuckahoe*, in 27 days from the laying of the keel, the ship being 85 per cent. completed. Apparently the shipbuilding programme of the country is now well under way with 550,000 workers and more expected. Mr. Charles M. Schwab, the new Director, has aroused enthusiasm all over the country. In April, 32 ships were built, and soon the monthly output will be 60. Labour conditions have also improved.

SHIPPING SHARE MARKET.

Whilst stock markets have generally been very inactive during the past week owing to the critical war news from France, there has been a further hardening of most shipping issues, the provincial centres continuing strong buyers of most of the leading shares. The revision of Blue Book rates has been a highly favourable factor, and there has been an exceptionally large crop of rumours respecting impending amalgamations. Royal Mails hold their own at the advanced price of 126, and Peninsular & Oriental deferred are steady at 338. There has not been an abnormal amount of business in the issues of shipping companies whose fleets are controlled by the International Mercantile Marine, although the president of the latter company has stated that the negotiations for the sale of the vessels to a British syndicate are "making entirely satisfactory progress." Furness Withy shares have not quite held the high water mark touched last week, but there have been no heavy sales, the reaction being due to the desire of a few holders to secure the good profits which the recent rise had given them. Cunards are firm at over 86s. Cairn Lines, Court Lines, and Sutherland Steamships have each been an active market with higher prices. Prince Lines, which had dropped out of the active list for a time, have reappeared and have recovered to 5¼. Tyne-Tees Shipping have also been freely purchased with numerous daily markings at about 28s. Griffiths Lewis have advanced on amalgamation rumours, the same also putting better Dulcia, Haenton, and some other Cardiff concerns. There is no further development respecting Tatem Steam shares which have been advanced to the nominal price of 5½-6½ on the announcement that a London firm of brokers is offering to buy the shares. The market received with pleasure the news that Sir William Tatem had received the honour of a peerage. It is understood that no shares in the company are being sold by Sir William Tatem. Dealings in iron and steel shares have been upon a lower scale and the amount of interest in shipbuilding undertakings' issues has declined in comparison with the past few weeks.

SHIPPING, SHIPBUILDING, ENGINEERING AND MARINE INSURANCE SHARE LIST.

SHIPPING.

Name.	Share and paid.	Extreme quotations, 1917.	Last ann. div. % or per share.	Yield. %	Quotation (See Note).	Rise or Fall.
	£					
African S.S.	20	30½—25½	10	6⅝	30	
Allan Line ... ... Deb.	100	—	*	4⅜	92	
Anchor Line ... Cum. pref.	10	9½—8¾	5⅛	6¼	8¾	
Do. ... ... Deb.	Stk.	105⅛—102⅛	4⅜	4⅝	102	
Argentine Nav. ... Cum. pref.	1	25/—14/3	6	5¼	22/6	
Do. ... ... Ord.	1	20/6—6/6	Nil.	Nil.	16/6	
Australasian Un. S. Nav. Deb.	Stk.	80⅛—79⅜	4	5	81	
Belfast Steam ... ... "A"	10 (5pd.)	—	5	5	5	
British & Argen. Nav. ... Deb.	Stk.	84—80	4⅜	5¼	81½	
British India Nav. ... Deb.	Stk.	84—82	4½	5½	81½	
British S.S. Invest. Trust Def.	Stk.	460—344¼	50*	11⅛	445	
Do. ... ... Pref.	Stk.	105⅛—104	6	5⅝	103⅝	
Do. ... ... Deb.	Stk.	74¼—70	4½	6 1/16	73	
Cairn Line ... ... Deb.	Bds.	94—90	5	5½	90⅛—91	
Do. ... ... Ord.	1	51/6—40/9	20†	8½	47/-	
Clan Line ... ... Ord.	10	55½—26⅜	25	5¼	43⅛xd	— ½
Court Line ... ... Ord.	£1	40/6—29/6	10	5½	37/9	— 1/1½
Cunard SS. ... ... Ord.	1	85/—63/9	20*	5	86/-	
Do. ... Cum. pref.	Stk.	97¾—82	5	5⅜	86	
Do. ... ... Deb.	Stk.	100—93¼	4½	4⅝	97	
Elder Line ... ... Deb.	Stk.	95—89	4½	4⅜	103	
Elder Dempster ... Cum. pref.	1	19/—17/-	5⅛	6¼	18/4½	— -/7½
Do. ... ... Deb.	Stk.	89—85	5	5⅞	83⅛	
Ellerman Lines ... Pref. Ord.	10	9½—8⅜	6½	6¼	9⅜	
Do. ... Guar. pref.	10	9—8¼	4½	5¼	8¼	
France Fenwick ... Cum. pref.	5	95/3—85/-	5⅛	6¼	85/-	
Furness, Withy ... Ord.	1	60/9—41/6	20*	6½	66/3	— -/9
Do. ... Cum. pref.	10	9—7¾	5	5⅞	8⅛	
General Steam Nav. Ord.	1	24/9—21/6	10	7½	31/6	
Do. ... ... Pref.	1	19/4½—15/-	5	6½	15/6	
Houlder Line ... Cum. pref.	5	82/6—75/-	5½	6½	81/3	
Do. ... ... Deb.	Stk.	—	4½	4¼	91	
Houlder Bros. ... Cum. pref.	5	—	5½	6⅜	4	
Do. ... ... Deb.	Stk.	—	4½	5⅜	82	
India Gen. Nav. & Rly. ... Ord.	10	11⅜—8¾	6	5½	11⅜	
Indo-China N. ... Pref. Ord.	5	97/6—87/6	6	6¼	97/6	
Irrawaddy Flotilla	40	—	12½	5	100	
Khedivial Mail ... ... Ord.	1	40/—24/-	20	12½	37/6	
Do. ... ... Pref.	5	76/3—70/-	5½	7⅜	72/6	
Do. ... ... Deb.	Stk.	95⅝—93	4½	4¾	94½	
King Line ... ... Ord.	1	42/6—31/6	12	5¼	48/-	+ 1/3
Lamport & Holt ... Cum. pref.	£1	20/4½—18/-	6	6	19/3	
Leyland (F.) ... Cum. pref.	10	8⅜—7¼	5	5⅞	8 1/16	
Mercantile SS. ... ... Ord.	5	30½—15	40	8	30½	
Do. ... ... Pref.	1	21/—15/9	5	6¾	20/-	
Moor Line ... ... Ord.	10	35-20	30	6⅝	41	
Nelson Steam Nav. ... Deb.	100	—	5	5⅛	98¾	
New Zealand ... ... Ord.	£10	—	8	2⅜	32½	
Do. ... ... Deb.	Stk.	87½—86⅛	4	4⅝	87	
Nitrate Producers SS. ... Ord.	5	25⅜—20	30	6¼	25⅜	
Do. ... Cum. pref.	5	100/—90/-	5	5	5	
Oceanic Steam. Nav. ... Deb.	100	98⅛—84	4⅛	4⅝	95½	+ ½
Orient.Stm.Nav.Co. Cum. pref.	10	9¼—8⅜	5	5¾	9¼	
Do. ... ... Deb.	100	92—88	4½	5⅛	87	
P. & O. S. N. ... Cum. pref.	100	93¾—84	5	5⅜	90	
Do. ... ... Def.	100	342—295	18	5⅜	338	+ 4
Do. ... ... Deb.	Stk.	65⅛—63½	3½	5⅜	63	
Prince Line	1	6⅜—3 1/16	30	5¾	105/-	
R.M.S.P. ... ... Ord.	100	125—109⅜	7	5¾	122⅜	+ 1¾
Do. ... ... Pref.	Stk.	85⅛—80	5	6	84	
Do. ... ... Deb.	Stk.	86—79	4⅜	5⅜	78⅛	
Shaw, Savill & Alb. Cum. pref.	5	87/6—80/-	5¼	5½	85/-	
Shell Transport ... ... Ord.	1	6½—98/3	35	5½	6	
Do. ... Cum. pref.	10	9¾—9⅛	5	5⅜	8⅝	
Sutherland SS. Co.	£1	75/—50/9	30	5⅜	1⅝xd	
Tyne-Tees Steam... ... Ord.	£1 (10/- pd.)	—	20	7 1/16	30/-	+ 2/-
Union-Castle SS. Cum. pref.	10	7⅞—7⅛	4⅜	6	7⅜	
Do. ... ... Deb.	Stk.	90—86	4	4⅜	90	
West Hartlepool ... ... Pref.	10	7¾—7⅛	5⅜	6⅝	8	

INSURANCE.

Alliance	20 (2·4 pd.)	10½—9	12/-	7	9⅝xd	— ⅜
London Assurance ...	25 (12½ pd.)	60⅜—48¾	22	7	65 5/16	
Merchants' Marine Insurance ...	10 (2½ pd.)	10⅜—6½	10	6	10⅜	
N. British & Mercantile Ord.	25 (6¼ pd.)	36—29	40/-	6⅜	34	
Phœnix Assurance ...	10 (1 pd.)	7⅛—6	40	7	8 1/16	+ 1/16
Royal Exchange Assurance ...	Stk.	241½—187	10	4¼	242½xd	
Sea Insurance	10 (2 pd.)	27½—24⅛	10	6	25⅝	
World Marine, Limited ...	5 (2 pd.)	6⅛—55/-	10	8	7⅜	

IRON AND STEEL.

Name.	Share and paid.	Extreme quotations, 1917.	Last ann. div. % or per share.	Yield. %	Quotation (See Note).	Rise or Fall.
	£					
Babcock & Wilcox... ... Ord.	1	68/—52/6	15	4½	65/9xd	—1/9
Baldwins ... Cum. pref.	1	20/—15/-	5½	5⅜	20/-	
Do. ... ... Deb.	Stk.	84—82	4½	5⅜	84	
Bayliss, Jones ... Cum. pref.	1	—	5	10	10/3	
Bell Bros. ... ... Cum. pref.	10	10—9½	8	6	9⅜	
Do. ... ... Deb.	Stk.	80—73¾	5	7	74	
Bessemer (Henry) ... Ord.	1	34/6—24/6	12⅜	7½	32/-	
Bolckow Vaughan ... Ord.	1	30/—22/2	11	7½	27/10½	
Do. ... ... Cum. pref.	20	17½—16¾	5	5⅜	16½	
Cargo Fleet Iron ... ... Ord.	1	24/9—17/3	3	2⅜	26/3	
Do. ... ... Deb.	100	84—81½	4⅜	5⅜	83	
Consett Iron Co. ... ... Ord.	1	36/3-24/10½	50	10	97/6	
Dominion Iron & Steel	Bds.	88⅛—71⅜	5	7	73	
Dorman, Long ... ... Ord.	1	50/—30/9	8†	—	36/3	
Do. ... ... Deb.	Stk.	—	4	5¼	71	
Ebbw Vale Steel & Iron Ord.	1	30/6—24/6	12⅜	9	30/-	— -/3
Guest, Keen & Nettefds Ord.	1	89/—62/6	15*	3⅜	85/-	
Do. ... ... Cum. pref.	5	5⅞—5	5	4⅜	5⅜	
Do. ... ... Deb.	Stk.	79⅜—73⅜	4	5¼	76⅜	
Hadfield's Steel Foundry Ord.	1	107/6—78/6	30	5⅜	100/6	
Ibbotson Bros.	5 (4 pd.)	7—6¼	7⅜	4⅜	6⅜	
Jessop (W.) & Sons ... Ord.	5 (4 pd.)	10—8	15*	6⅜	9¼	
Lanarkshire Steel Cum. pref.	10	—	5	7⅛	7	
Lysaght (J.) ... Cum. pref.	1	25/—20/-	6	6	20/6	
Do. ... ... 2nd pref.	1	19/9—19/4½	6	6	19/6	
Manganese Bronze ... Ord.	1	—	6	11	⅛	
Do. ... ... Cum. pref.	1	—	6	8	⅜	
North-Eastern Steel ... Deb.	Stk.	—	4⅜	—	78⅜	
Palmers Ship & Iron "A" ...	1	13/—9/9	Nil.	Nil.	13/9	
Scott (Walter) ... ... Ord.	1	29/4½-21/3	15	10⅜	26/4½	
Do. ... ... Pref.	1	19/9—16/-	6	7⅜	20/6	
Sheffield Forge ... ... Ord.	1	—	15	4½	70/-	
Shelton Iron & Steel ... Ord.	1	24/6-16/10½	7½	6	20/3	
Do. ... ... Deb.	100	91⅛—91	5	5⅜	91/⅜	
S. Durham Steel & Iron Ord.	1	42/9—29/6	10	4¾	43 -	
Do. ... ... Cum. pref.	1	20/9—18/7½	6	6½	20/7½	
Do. ... ... Deb.	Stk.	81—80	4⅜	5⅜	80	
Steel Co. of Scotland ... Ord.	10	—	10	6½	15½	
Stewarts & Lloyds Pref. ord.	10	17—16	10	6½	16	
Do. ... ... Cum. pref.	10	—	6	5⅜	10¾	
Stone (J.) ... ... Cum. pref.	10	8⅛—7⅞	5	6⅜	7 7/16	
United States Steel ... Ord.	100$	124—109⅛	8	7	103¾‡	
Do. ... ... Cum. pref.	100$	—	7	7	115½xd‡	
Vickers Ltd. ... ... Ord.	1	44/6—35/3	12⅜	6	42/-	+ -/6
Do. ... ... Pref.	Stk.	84—81	5	6	83	
Do. ... ... Deb.	Stk.	79—74½	4	5 3/16	77	
Weardale Steel ... Def. ord.	1	32/3—23/-	19¼	13¼	29/-	
Do. ... ... Pref. ord.	1	25/3—18/9	6	5¼	25/-	
Do. ... ... Deb.	Stk.	—	4	6⅜	62	
Workington Iron & Steel Ord.	1	30/3—21/-	10	6⅜	28/9	

SHIPBUILDING AND MARINE ENGINEERING.

Armstrong, Whitworth Ord.	1	45/—36/-	12⅜	5¾	41/6	— -/3
Do. ... ... Cum. pref.	5	73/9—67/-	4	5⅜	70/-	
Do. ... ... Deb.	Stk.	78—73	5	6⅜	75⅜	
Beardmore (W.) ... ... Deb.	100	93—89	4⅜	5	93	
Brown (John) ... ... Ord.	1 (15s. pd.)	29-/—22/9	12½	7	28/-	
Do. ... ... Cum. pref.	10	8⅜—7⅜	5	5⅜	8¼	
Cammell Laird ... ... Ord.	5	7⅜—6¼	10	7⅛	6⅜	
Do. ... ... Cum. pref.	5	85/6—74/6	5	6½	75/-	
Do. ... ... Deb.	100	83⅞—79⅜	4⅜	5⅜	84	
Dunlop (Jas.) ... ... Ord.	1	28/9—16/-	10	9⅛	22/1½	
Do. ... ... Cum. pref.	1	18/9—16/6	6	7⅛	18/-	
Fairfield Shipbldg Cum. pref.	10	8⅜—8¼	6	7⅛	8¼	
Fleming & Ferguson ... Ord.	10	—	10	7	14¼	
Gray (Wm.) ... ... Deb.	100	100—95⅜	4⅜	4⅞	97½	
Hawthorn (R. & W.) Leslie Ord.	1	—	12⅜	6¼	38/6	
Henderson (D. & W.) Cum. pref.	1	—	5	9	9 1/16	
Richardsons Westgarth Ord.	1	10/3—5/-	Nil.	Nil.	10/-	
Do. ... ... Cum. pref	1	19/9—12/6	Nil.	Nil.	18/1⅜	+ -/1⅜
Do. ... ... Deb.	Stk.	67—62	4⅜	6⅜	66	
Simons (W.) ... Cum. pref.	10	—	5	5	9 1/16	
Swan, Hunter & W. R. ... Ord.	1	51/—33/6	12⅜	5⅜	52/3	
Do. ... ... Cum. pref.	1	17/3—17/-	5	5⅜	17/-	
Do. ... ... Deb.	Stk.	78—77	4⅜	5⅜	77	
Thornycroft (John I.) ... Ord.	1	45/—16/-	17⅜	8¾	38/-xd	
Do. ... ... Cum. pref	1	19/—16/-	6	6⅜	18/9	
Do. ... ... Deb.	100	—	5	5⅜	82⅜	
Wallsend Slipway ... Ord.	1	2—1⅜	10	2¾	39/6	
Do. ... ... Cum. pref.	1	1—1	5	5	19/-	

* Including bonus. † Also 20 % in shares. ‡ Treasury price.

NOTE.—Owing to the nominal character of business in many shares the quotations in this column do not necessarily represent the actual prices at which business can be transacted, but are intended to indicate the average price at which business has occurred.

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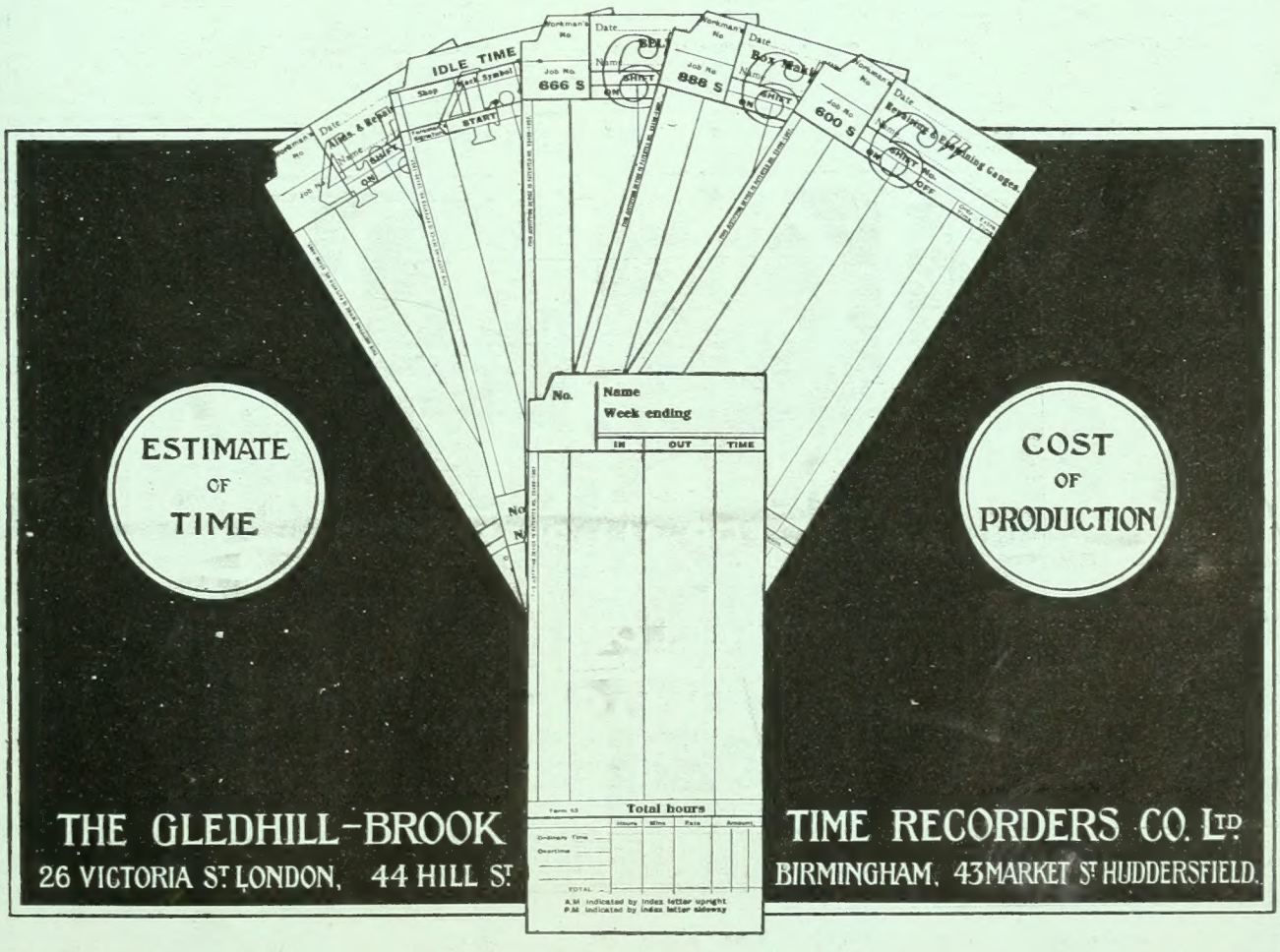

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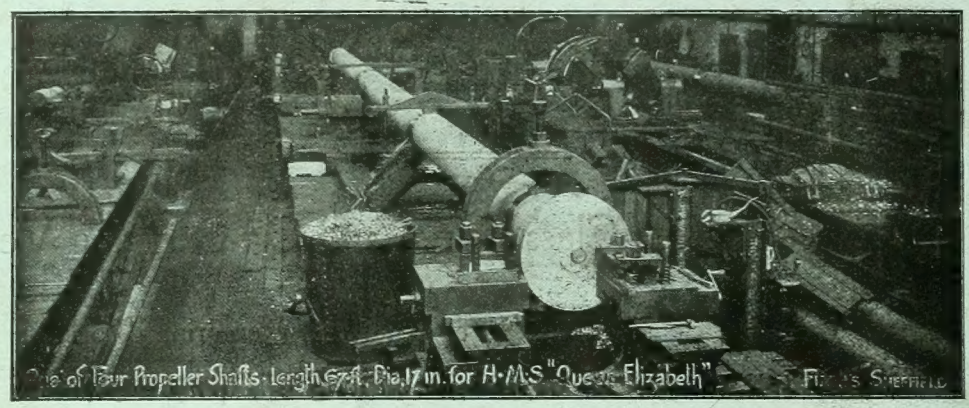

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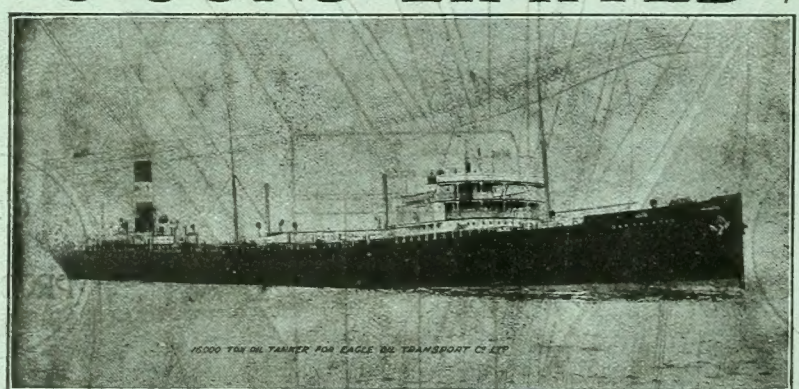

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